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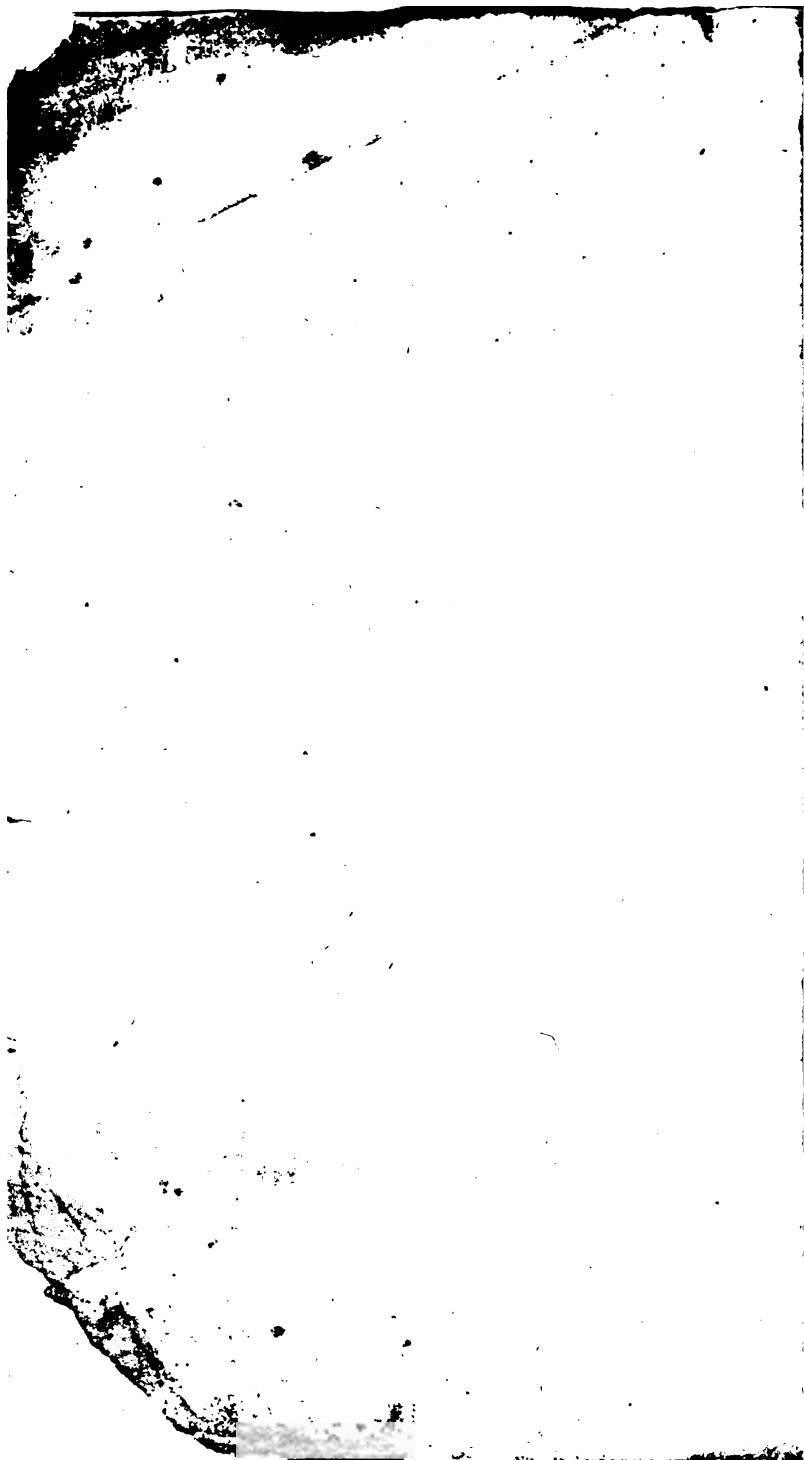
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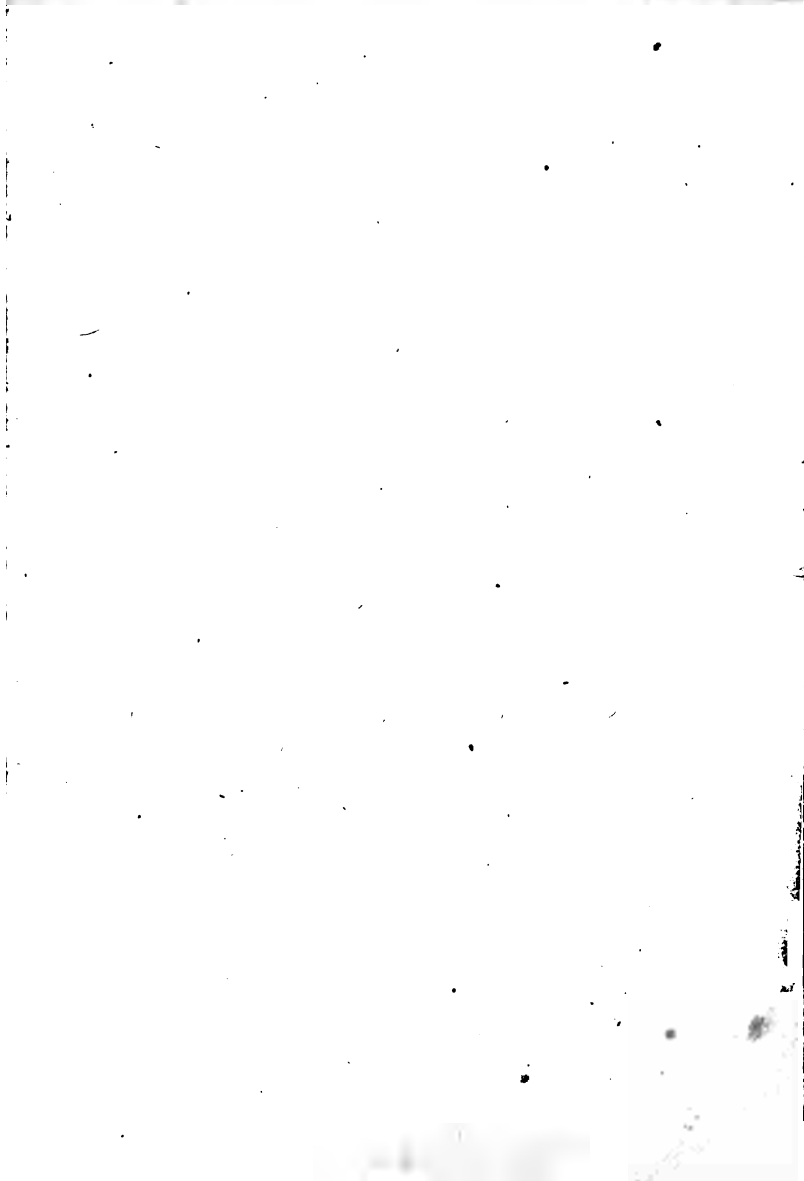
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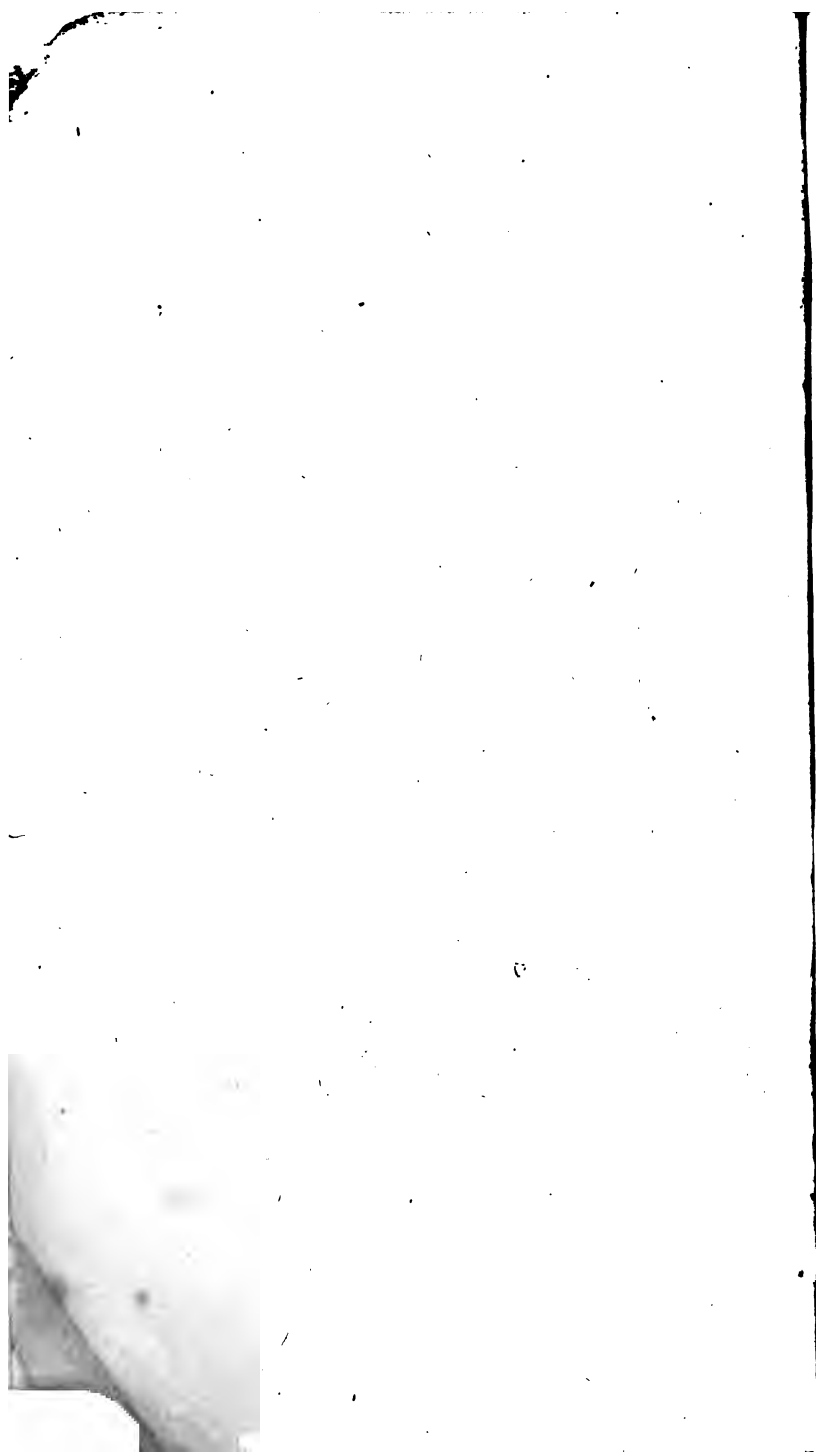
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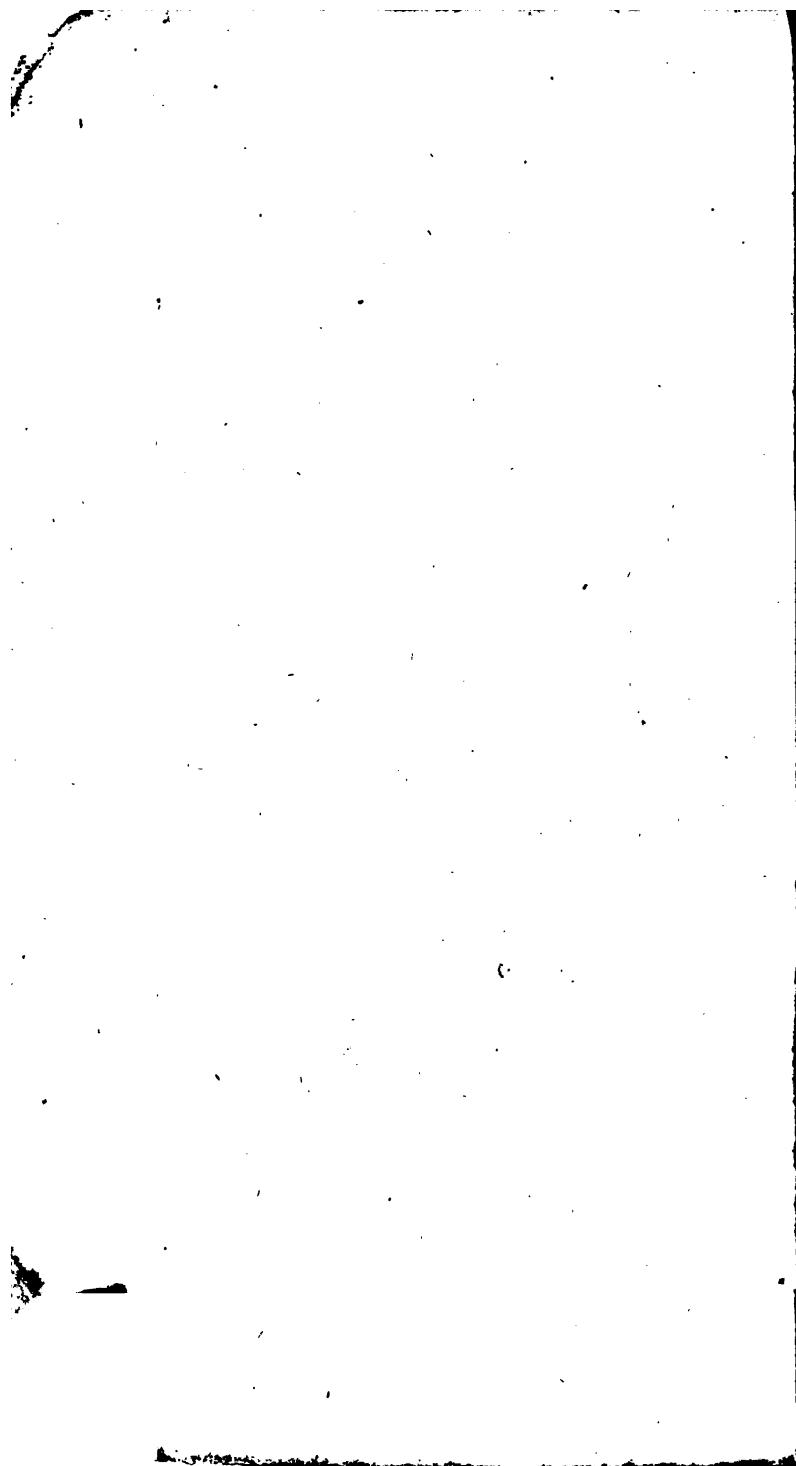






Mr. J. Higgins.
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INTRODUCTION
TO
LOGIC.



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INTRODUCTION

TO

LOGIC:

FROM

DR. WHATELY'S 'ELEMENTS OF LOGIC.'

BY THE

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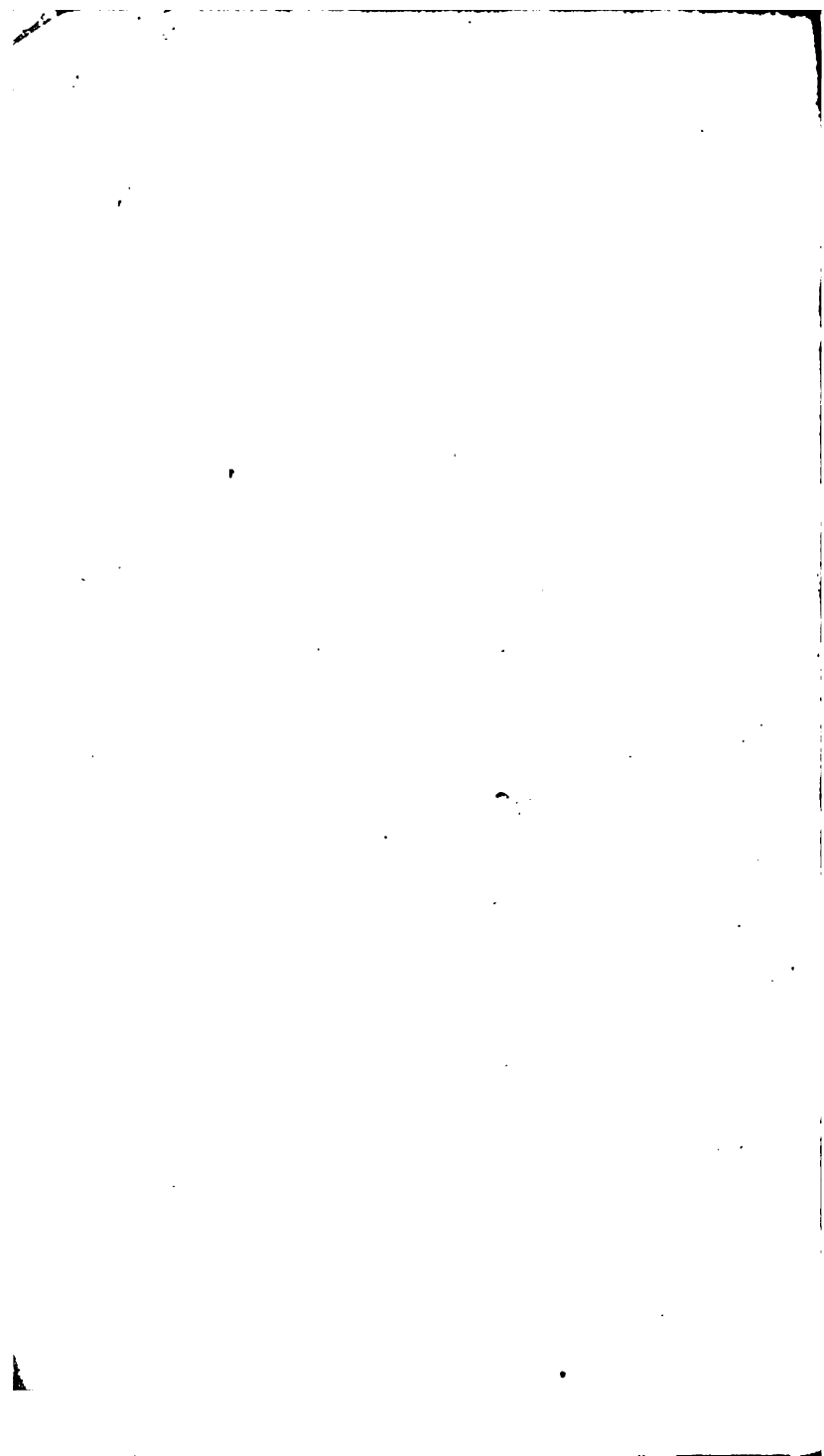
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P R E F A C E.

THIS treatise contains only a selection from Dr. Whately's Elements of Logic, of so much of that work as is necessary to qualify a candidate for examination in the Schools; and to that large class, whose only motive for studying logic is the attainment of this object, it is addressed. To many the study may never become further useful; and with respect to these, it is only desirable that it should occasion as little unnecessary labour and waste of time as is possible. As long as logic is made a requisite in our course of education, even the convenience of those who are incapable of

embracing the system, fully deserves to be consulted. But it may be fairly presumed, that among those who are "getting up" logic, as it is termed, only to forget it as soon as it has served their immediate purpose, there are not a few whose distaste of the study arises wholly from a mistaken view of it. For the sake of these, more especially, the present undertaking has been suggested.

In offering the Elements of Logic in a compendious form to this class of students, more is designed than their convenience. Not the least valuable feature of the treatise from which this is selected is, that it displays—and it is the only one that has clearly done so—the true nature and use of logic; so that it may be approached no longer as a dark, curious, and merely speculative study; such as one is apt, in fancy,

to class with astrology and alchymy. Enough, then, will be preserved in the following pages to remove from this study all false views of its character, and to excite, it is hoped, a spirit of further enquiry in many who, under the influence of old prejudice, would hardly be persuaded to apply in the first instance to a more bulky treatise.

Among the erroneous notions concerning logic, one very common is, *that it is a peculiar method of reasoning*. It will greatly facilitate the student's acquaintance with the system, to get rid of this notion before he enters on the treatise. He will find no such pretension advanced. It merely undertakes to point out the steps which all who reason rightly adopt, whether writing, debating, holding familiar conversation, or even pursuing a train of solitary and

silent reflection. It only reminds a sensible man of a process which his mind goes through every day of his life ; and if any one doubt this, let him only try the method of analysis here given, by applying it to any argument which he has ever used or met with, however trifling the subject may be. It is in this point of view that it is properly called a Science.

Another erroneous notion concerning logic is, that it cannot generally be of use. It is wrong to assert this until you have fairly tried its application. At all events, it is desirable that the use to which it pretends should not be misunderstood. Suppose that you shall have learnt from the system the process which every man's mind goes through who reasons rightly, whether in writing, public speaking, conversing, or meditating ; it is clear, that with due practice

you may learn to unravel this process in whatever you read or listen to, and become able to detect any false step which may have been taken, any omission which may have been made; in short, any error of reasoning whatever. Of course, the same test which you can apply to the arguments of another, must be equally applicable to your own, and must enable you, in your own reasonings, to detect any error, supposing them to be erroneous, or to evince their correctness, supposing them to be correct. It is in this view that logic is an Art; and for its application as such, rules by which you may try any argument are given.

As these rules, however, only apply to an argument after it has been exhibited in its bare elementary form, it may not be useless to premise here some re-

marks on the proper method of analysing and reducing it to that form, especially as this must ordinarily be the first step taken, in an attempt to apply the rules of logic.

First, then, of whatever length the reasoning may be, whether book, pamphlet, or paragraph, begin with the concluding assertion*, and tracing the reasoning backwards, see on what ground that assertion is made. The assertion will be your conclusion, the ground on which it rests, your premises. The whole syllogism thus obtained may then be tried by the rules of logic.

Secondly, if no error be detected, then take your premises separately, and pursue with each the same course as

* The assertion will not necessarily be the last sentence, but the last point proved ; and this whether it be formally enunciated or not.

you before pursued with respect to the conclusion. Your premiss must have been used as such, either because it required no proof, or because it had been proved. If it have not been proved, see whether it be so self-evident as to have required no proof; if it have been proved, then consider it in the light of a conclusion derived from other assertions which were premises to it. The process with which you set out will now be repeated: see what grounds are given for the assertion; state these as premises, and the assertion as the conclusion; and apply as before the proper rules to what will then be a syllogism. Having satisfied yourself of the correctness of this, proceed as before to convert your premises, if needful, into conclusions derived from former assertions.

The investigation will thus go on, if the whole chain of reasoning be correct, until you arrive at the premises with which it all commences; (which, of course, must be always assertions requiring no proof;) or, if the reasoning be anywhere incorrect, until you meet with some premiss unfairly assumed as such, either as not being proved, yet requiring proof, or as being incorrectly deduced as a conclusion from other assertions.

It will often happen that the same assertion will have been proved by several different arguments; and then your enquiry into the truth of the premises will branch out as in the examples given: (vide pages 144, 145.) In this case, you may observe, you have first to try each argument separately; and, should

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the conclusions be probable^b, not only to satisfy yourself that each has been correctly drawn, but to calculate the amount of aggregate probability. In this calculation, logic only so far assists, as it places the several sums of probability, (if I may use the expression,) in the most convenient form: but even this assistance will not be thought lightly of by any who duly appreciate the difficulty of estimating the comparative value of probabilities, and the supreme importance of a right habit of doing so, in all questions, not of philosophy and literature alone, but of life.

One more preliminary observation may be requisite. The present treatise only pretends to develop the process of

^b *Probable*, as opposed to a *demonstrated* assertion, which of course could not be rendered more certain by additional proofs.

the mind in *reasoning*, and to give rules for right *reasoning*. But doubts may be removed, and real or apparent diversities of opinion reconciled, without any process of reasoning. For instance, I may assert, and you deny, that it is one o'clock; and the difference would be most easily settled by looking at a watch. Again, you may make an assertion, which, being ambiguous, may be admitted in one of its senses, but in no other. If such an assertion were questioned, it would not properly be defended by a process of reasoning, but by a statement of the ambiguity. In the following treatise, indeed, ambiguity of expression is considered; but it is only as it affects deductions drawn from premises. Of the manner in which it causes, not false or opposite *conclusions*, but false or opposite *judgements*, a

few examples will be appended to those which are strictly logical : (vide page 147.)

Again, two assertions may seem to be inconsistent, from your mistaking the kind of opposition between them, or from thinking them to be opposed when they are not. In this case also you would resort not to *reasoning*, but to a statement which would render *reasoning* unnecessary, viz. that no opposition existed between the two assertions; or such as did not hinder them both being true. If I assert, e. g. that "the measures pursued by the late ministry were wise," meaning that most of them were wise; and you assert that "unwise measures were pursued by the late ministry," meaning that some of the measures were unwise; the apparent difference would be reconciled by stating

that the opposition was subcontrary, not as it must have appeared to the contending parties, contradictory or contrary: (vide p. 64. and examples, p. 147.)

ELEMENTS OF LOGIC.

CHAPTER I.

ANALYTICAL OUTLINE OF THE SCIENCE.

§ 1.

IN every instance in which we *reason*, in the strict sense of the word, i. e. make use of arguments, whether for the sake of refuting an adversary, or of conveying instruction, or of satisfying our own minds on any point, whatever may be the subject we are engaged on, a certain process takes place in the mind, which is one and the same in all cases, provided it be correctly conducted.

Of course it cannot be supposed that every one is even conscious of this process in his own mind; much less, is competent to explain the principles on which it proceeds; which indeed is, and cannot but be, the case with every other process respecting which any system has been formed: the practice not only may exist independently of the theory, but *must* have preceded the theory; there must have been language before a system of grammar could be devised; and musical compositions previous to the science of music. This, by the way, will

serve to expose the futility of the popular objection against logic, that men may reason very well who know nothing of it*. The parallel in-

* Locke has a great deal to this purpose ; e. g. in chap. xvii. "on reason," (which, by the way, he perpetually confounds with *reasoning*.) He says, in § 4, "If syllogisms must be taken for the only proper instrument of reason and means of knowledge, it will follow, that before Aristotle there was not one man that did or could know any thing by reason ; and that since the invention of syllogisms, there is not one in ten thousand that doth. But God has not been so sparing to men to make them barely two-legged creatures, and left it to Aristotle to make them rational, i. e. those few of them that he could get so to examine the grounds of syllogisms, as to see that in above three-score ways that three propositions may be laid together, there are but fourteen wherein one may be sure that the conclusion is right," etc. "God has been more bountiful to mankind than so : he has given them a mind that can reason without being instructed in methods of syllogizing," etc. All this is not at all less absurd than if any one, on being told of the discoveries of modern chemists respecting caloric, and on hearing described the process by which it is conducted through a boiler into the water, which it converts into a gas of sufficient elasticity to overcome the pressure of the atmosphere, etc. should reply, "If all this were so, it would follow, that before the time of these chemists no one ever did or could make any liquor boil."

In an ordinary, obscure, and trifling writer, all this confusion of thought and common-place declamation might as well have been left unnoticed ; but it is due to the general ability and to the celebrity of such an author as Locke, that errors of this kind should be exposed.

He presently after inserts an encomium upon Aristotle, in which he is equally unfortunate ; he praises him for the "*invention of syllogisms* ;" to which he certainly had no more claim than Linnæus to the *creation* of plants and animals, or Hervey to the praise of having *made the blood circulate*, or Lavoisier to that of having *formed the atmosphere* we breathe. And the utility of this invention consists, according to him, in the great ser-

stances adduced, show that such an objection might be applied in many other cases, where its absurdity would be obvious ; and that there is no ground for deciding thence, either that the system has no tendency to improve practice, or that even if it had not, it might not still be a dignified and interesting pursuit.

One of the chief impediments to the attainment of a just view of the nature and object of logic, is the not fully understanding, or not sufficiently keeping in mind, the SAMENESS of the reasoning process in all cases. If, as the ordinary mode of speaking would seem to indicate, mathematical reasoning, and theological, and metaphysical, and political, etc. were essentially different from each other, i. e. different *kinds of reasoning*, it would follow, that supposing there could be at all any such science as we have described logic, there must be so many different species, or at least different branches of logic. And such is, perhaps, the most prevailing notion. Nor is this much to be wondered at ; since it is evident to all, that some men converse and write, in an argumentative way, very justly on one subject, and very erroneously on another ; in which again others ex-

vice done against those who were not ashamed to deny any thing ; a service which never could have been performed, had syllogisms been an *invention* of Aristotle's ; for what sophist could ever have consented to *restrict himself to one particular kind of arguments, dictated by his opponent ?*

Reasoning
process si-
milar in all
subjects.

cel, who fail in the former. This error may be at once illustrated and removed, by considering the parallel instance of arithmetic, in which every one is aware that the process of a calculation is not affected by the nature of the objects whose numbers are before us: but that (e. g.) the multiplication of a number is the very same operation, whether it be a number of men, of miles, or of pounds; though, nevertheless, persons may perhaps be found who are accurate in calculations relative to natural philosophy, and incorrect in those of political economy, from their different degrees of skill in the subjects of these two sciences; not, surely, because there are different arts of arithmetic applicable to each of these respectively.

Others again, who are aware that the simple system of logic may be applied to all subjects whatever, are yet disposed to view it as a peculiar method of reasoning, and not, as it is, a method of unfolding and analyzing our reasoning: whence many have been led (e. g. the author of the *Philosophy of Rhetoric*) to talk of comparing syllogistic reasoning with moral reasoning; taking it for granted, that it is possible to reason correctly without reasoning logically; which is, in fact, as great a blunder as if any one were to mistake *grammar* for a peculiar *language*, and to suppose it possible to speak correctly without speaking grammatically.—They have, in short, considered logic as *an art*

of reasoning ; whereas (so far as it is an art) it is *the* art of reasoning ; the logician's object being, not to lay down principles by which one *may* reason, but by which all *must* reason, even though they are not distinctly aware of them :— to lay down rules, not which *may* be followed with advantage, but which cannot possibly be *departed* from in sound reasoning. These misapprehensions and objections being such as lie on the very threshold of the subject, it would have been hardly possible, without noticing them, to convey any just notion of the nature and design of the logical system.

§ 2.

Supposing it, then, to have been perceived, that the operation of reasoning is in all cases the same, the analysis of that operation could not fail to strike the mind as an interesting matter of inquiry : and, moreover, since (apparent) arguments which are unsound and inconclusive, are so often employed, either from error or design ; and since even those who are not misled by these fallacies, are so often at a loss to detect and expose them in a manner satisfactory to others, or even to themselves ; it could not but appear desirable to lay down some general rules of reasoning, applicable to all cases, by which a person might be enabled the more readily and clearly to state the grounds of his own conviction, or of his objec-

tion to the arguments of an opponent; instead of arguing at random, without any fixed and acknowledged principles to guide his procedure. Such rules would be analogous to those of arithmetic, which obviate the tediousness and uncertainty of calculations in the head, wherein, after much labour, different persons might arrive at different results, without any of them being able distinctly to point out the error of the rest. A system of such rules, it is obvious, must, instead of deserving to be called the art of wrangling, be more justly characterised as the "art of cutting short wrangling," by bringing the parties to issue at once, if not to agreement; and thus saving a waste of ingenuity.

Analysis of
argument.

In pursuing the supposed investigation, it will be found that every conclusion is deduced, in reality, from two other propositions; (thence called *premises*;) for though one of these may be, and commonly is, suppressed, it must nevertheless be understood as admitted; as may easily be made evident by supposing the denial of the suppressed premiss, which will at once invalidate the argument: e. g. if any one, from perceiving that "the world exhibits marks of design," infers that "it must have had an intelligent author," though he may not be aware in his own mind of the existence of any other premiss, he will readily understand, if it be *denied* that "whatever exhibits marks of design,

must have had an intelligent author," that the affirmative of that proposition is necessary to the validity of the argument. An argument thus stated regularly, and at full length, is called a syllogism; which therefore is evidently not a peculiar *kind of argument*, but only a peculiar *form* of expression, in which every argument may be stated.

When one of the premises is suppressed, (which for brevity's sake it usually is,) the argument is called an enthymeme. And it may be worth while to remark, that when the argument is in this state, the objections of an opponent are (or rather appear to be) of two kinds; viz. either objections to the *assertion* itself, or objections to its *force* as an argument; e. g. in the above instance, an atheist may be conceived either denying that the world *does* exhibit marks of design, or denying that it *follows* from thence that it had an intelligent author. Now, it is important to keep in mind, that the only difference in the two cases is, that in the one the *expressed* premiss is denied; in the other the *suppressed*; for the *force as an argument* of either premiss depends on the other premiss: if both be admitted, the conclusion legitimately connected with them cannot be denied.

It is evidently immaterial to the argument whether the conclusion be placed first or last;

but it may be proper to remark, that a premiss placed *after* its conclusion is called the *reason* of it, and is introduced by one of those conjunctions which are called causal, viz. "since," "because," etc. which may indeed be employed to designate a premiss, whether it came first or last. The illative conjunctions, "therefore," etc. designate the conclusion.

It is a circumstance which often occasions error and perplexity, that both these classes of conjunctions have also another signification, being employed to denote, respectively, *cause* and *effect*, as well as *premiss* and *conclusion*: e. g. if I say, (to use an instance employed by Aristotle,) "yonder is a fixed star, *because* it twinkles;" or, "it twinkles, and *therefore* is a fixed star;" I employ these conjunctions to denote the connection of *premiss* and *conclusion*; for it is plain that the twinkling of the star is not the cause of its being fixed, but only the cause of *my knowing* that it is so: but if I say, "it twinkles *because* it is a fixed star;" or, "it is a fixed star, and *therefore* twinkles;" I am using the same conjunctions to denote the connection of *cause* and *effect*: for in this case the twinkling of the star, being evident to the eye, would hardly need to be *proved*, but might need to be accounted for. There are, however, many cases in which the cause is employed to *prove* the existence of its effect; especially in

Proof and
cause.

arguments relating to *future* events^b: the *cause* and the reason, in that case, coincide; and this contributes to their being so often confounded together in other cases.

§ 3.

In an argument, such as the example above given, it is, as has been said, impossible for any one, who admits both premises, to avoid admitting the conclusion; but there will be frequently an apparent connection of premises with a conclusion which does not, in reality, follow from them, though to the inattentive or unskilful the argument may appear to be valid: and there are many other cases in which a doubt may exist whether the argument be valid or not; i. e. whether it be possible or not to admit the premises, and yet deny the conclusion. It is of the highest importance, therefore, to lay down some regular form to which every valid argument may be reduced, and to devise a rule which shall show the validity of every argument in that form, and consequently the unsoundness of any apparent argument which cannot be reduced to it:—e. g. if such an argument as this be proposed, “every rational agent is accountable; brutes are not rational agents; therefore they are not accountable:” or again, “all wise legislators suit their

Apparent
arguments.

^b As, e. g. when from favourable weather any one argues that the crops are likely to be abundant.

laws to the genius of their nation ; Solon did this ; therefore he was a wise legislator :” there are some, perhaps, who would not perceive any fallacy in such arguments, especially if enveloped in a cloud of words ; and still more when the conclusion is true, or (which comes to the same point) if they are disposed to believe it : and others might perceive, indeed, but might be at a loss to explain the fallacy. Now these (apparent) arguments exactly correspond, respectively, with the following, the absurdity of the conclusions from which is manifest : “ every horse is an animal ; sheep are not horses ; therefore they are not animals.” and, “ all vegetables grow ; an animal grows ; therefore it is a vegetable.” These last examples, I have said, correspond exactly (considered as arguments) with the former ; the question respecting the validity of an argument being, not whether the conclusion be *true*, but whether it *follows* from the premises adduced. This mode of exposing a fallacy, by bringing forward a similar one whose conclusion is obviously absurd, is often, and very advantageously, resorted to in addressing those who are ignorant of logical rules^c ; but to lay down such rules, and

^c An exposure of some of Hume’s fallacies in his Essay on Miracles, and elsewhere, was attempted, on this plan, a few years ago, in a pamphlet (published anonymously, as the nature of the argument required, but which I see no reason against acknowledging) entitled, Historic Doubts relative to Napoleon

employ *them* as a test, is evidently a safer and more compendious, as well as a more philosophical mode of proceeding. To attain these, it would plainly be necessary to analyze some clear and valid arguments, and to observe in what their conclusiveness consists.

Let us suppose, then, such an examination to be made of the syllogism above mentioned: "whatever exhibits marks of design had an intelligent author; the world exhibits marks of design; therefore the world had an intelligent author." In the first of these premises we find it assumed universally of the *class* of "things which exhibit marks of design," that they had an intelligent author; and in the other premiss, "the world" is referred to that class as comprehended in it: now it is evident, that whatever is said of the whole of a class, may be said of any thing comprehended in that class; so that we are thus authorised to say of the world, that it had an intelligent author. Again, if we examine a syllogism with a negative conclusion, as, e. g. "nothing which exhibits marks of design could have been produced by chance: the world exhibits, etc.; therefore the world could not have been produced by chance:" the process of reasoning will be found to be the

Buonaparte; in which it was shown, that the existence of that extraordinary person could not, on Hume's principles, be received as a well-authenticated fact; since it rests on evidence less strong than that which supports the scriptures.

same; since it is evident, that whatever is *denied* universally of any class, may be denied of any thing that is comprehended in that class.

On further examination it will be found, that all valid arguments whatever may be easily reduced to such a form as that of the foregoing syllogisms; and that, consequently, the principle on which they are constructed is the **UNIVERSAL PRINCIPLE** of reasoning. So elliptical, indeed, is the ordinary mode of expression, even of those who are considered as prolix writers,—i. e. so much is implied and left to be understood in the course of argument, in comparison of what is actually stated, (most men being impatient, even to excess, of any appearance of unnecessary and tedious formality of statement,) that a single sentence will often be found, though perhaps considered as a single argument, to contain, compressed into a short compass, a chain of several distinct arguments; but if each of these be fully developed, and the whole of what the author intended to imply be stated expressly, it will be found that all the steps, even of the longest and most complex train of reasoning, may be reduced into the above form.

It is a mistake (which might appear scarcely worthy of notice, had not so many, even esteemed writers, fallen into it) to imagine that Aristotle and other logicians meant to propose that this prolix form of unfolding arguments

should universally supersede, in argumentative discourses, the common forms of expression; and that to reason logically means, to state all arguments at full length in the syllogistic form: and Aristotle has even been charged with inconsistency for not doing so; it has been said, that "in his treatises of Ethics, Politics, etc. he argues like a rational creature, and never attempts to bring his own system into practice^d." As well might a chemist be charged with inconsistency for making use of any of the compound substances that are commonly employed, without previously analyzing and resolving them into their simple elements; as well might it be imagined, that to speak grammatically means, to parse every sentence we utter. The chemist (to pursue the illustration) keeps by him his tests and his method of analysis, to be employed when any substance is offered to his notice, the composition of which has not been ascertained, or in which adulteration is suspected. Now, a fallacy may aptly be compared to some adulterated compound; "it consists of an ingenious mixture of truth and falsehood, so entangled,—so intimately blended,—that the falsehood is (in the chemical phrase) *held in solution*: one drop of sound logic is that test which immediately disunites them, makes the

^d Lord Kaimes.

foreign substance visible, and precipitates it to the bottom*.”

§ 4.

Aristotle's
dictum.

But to resume the investigation of the principles of reasoning: the maxim resulting from the examination of a syllogism in the foregoing form, and of the application of which every valid argument is, in reality, an instance, is, “that whatever is predicated (i. e. affirmed or denied) universally, of any class of things, may be predicated, in like manner, (viz. affirmed or denied) of anything comprehended in that class.” This is the principle, commonly called the *dictum de omni et nullo*, for the establishment of which we are indebted to Aristotle, and which is the keystone of his whole logical system. It is not a little remarkable that some, otherwise judicious writers, should have been so carried away by their zeal against that philosopher, as to speak with scorn and ridicule of this principle, on account of its obviousness and simplicity; though they would probably perceive at once, in any other case, that it is the greatest triumph of philosophy to refer many, and seemingly very various, phenomena to one,

* This excellent illustration is cited from a passage in an anonymous pamphlet, entitled, an Examination of Kett's Logic. The author displays, though in a hasty production, great reach of thought, as well as knowledge of his subject.

or a very few, simple principles ; and that the more simple and evident such a principle is, provided it be truly applicable to all the cases in question, the greater is its value and scientific beauty. If, indeed, any principle be regarded as *not* thus applicable, *that* is an objection to it of a different kind. Such an objection against Aristotle's dictum, no one has ever attempted to *establish* by any kind of proof; but it has often been *taken for granted* ; it being, as has been stated, very commonly supposed, without examination, that the syllogism is a *distinct kind of argument*; and that the rules of it, accordingly, do not apply, nor were intended to apply, to *all* reasoning whatever. Under this misapprehension, Campbell^f labours, with some ingenuity, and not without an air of plausibility, to show that every syllogism must be futile and worthless, because the premises virtually assert the conclusion : little dreaming, of course, that his objections, however specious, lie against the *process of reasoning itself*, universally ; and will, therefore, of course, apply to those very arguments which he is himself adducing.

It is much more extraordinary to find another author^g adopting, expressly, the very same objections, and yet distinctly admitting (within

^f Philosophy of Rhetoric.

^g Dugald Stewart : Philosophy, vol. ii.

a few pages) the possibility of reducing every course of argument to a series of syllogisms.

The same writer brings an objection against the dictum of Aristotle, which it may be worth while to notice briefly, for the sake of setting in a clearer light the real character and object of that principle. Its application being, as has been seen, to a regular and conclusive syllogism, he supposes it intended to prove and *make evident* the conclusiveness of such a syllogism; and remarks how unphilosophical it is to attempt giving a *demonstration of a demonstration*. And certainly the charge would be just, if we could imagine the logician's object to be, to *increase the certainty* of a conclusion which we are supposed to have already arrived at by the clearest possible mode of proof. But it is very strange that such an idea should ever have occurred to one who had even the slightest tincture of natural philosophy: for it might as well be imagined, that a natural philosopher's or a chemist's design is to strengthen the testimony of our senses by *à priori* reasoning, and to convince us that a stone when thrown will fall to the ground, and that gunpowder will explode when fired; because they show that according to their principles those phenomena must take place as they do. But it would be reckoned a mark of the grossest ignorance and stupidity not to be aware that their object is not to *prove* the existence of an individual

phenomenon, which our eyes have witnessed, but (as the phrase is) to *account* for it: i. e. to show according to what *principle* it takes place; —to refer, in short, the *individual case* to a *general law* of nature. The object of Aristotle's dictum is precisely analogous: he had, doubtless, no thought of adding to the force of any individual syllogism; his design was to point out the *general principle* on which that process is conducted which takes place in each syllogism. And as the laws of nature (as they are called) are in reality merely *generalized facts*, of which all the phenomena coming under them are particular instances; so the proof drawn from Aristotle's dictum is not a distinct demonstration brought to confirm another demonstration, but is merely a generalized and abstract statement of *all* demonstration whatever; and is, therefore, in fact, *the very demonstration* which, (*mutatis mutandis*,) accommodated to the various subject matters, is actually employed in each particular case.

In order to trace more distinctly the different steps of the abstracting process, by which any particular argument may be brought into the most general form, we may first take a syllogism stated accurately and at full length, such as the example formerly given, "whatever exhibits marks of design," etc. and then somewhat generalize the expression, by substituting (as in Algebra) arbitrary unmeaning

symbols for the significant terms that were originally used ; the syllogism will then stand thus : " every B is A ; C is B ; therefore C is A." The reasoning is no less evidently valid when thus stated, whatever terms A, B, and C, respectively may be supposed to stand for : such terms may indeed be inserted as to make all, or any of, the assertions *false* ; but it will still be no less impossible for any one who *admits* the truth of the *premises*, in an argument thus constructed, to deny the conclusion ; and this it is that constitutes the conclusiveness of an argument.

Viewing then the syllogism thus expressed, it appears clearly, that " A stands for *any thing whatever* that is affirmed of a whole class," (viz. of *every* B,) " which comprehends or contains in it *something else*," viz. C ; (of which B is, in the second premiss, affirmed ;) and that, consequently, the first term (A) is, in the conclusion, predicated of the third C.

Now to assert the validity of this process, now before us, is to state the very dictum we are treating of, with hardly even a verbal alteration : viz.

1. Anything whatever, predicated of a whole class,
2. Under which class something else is contained,
3. May be predicated of that which is so contained.

The three members into which the maxim is here distributed, correspond to the three propositions of the syllogism to which they are intended respectively to apply.

The advantage of substituting for the terms, in a regular syllogism, arbitrary unmeaning symbols, such as letters of the alphabet, is much the same as in mathematics: the reasoning itself is then considered, by itself, clearly, and without any risk of our being misled by the truth or falsity of the conclusion; which is, in fact, accidental and variable; the essential point being, as far as the *argument* is concerned, the *connexion between* the premises and the conclusion. We are thus enabled to embrace the general principle of all reasoning, and to perceive its applicability to an indefinite number of individual cases. That Aristotle, therefore, should have been accused of making use of these symbols for the purpose of *darkening* his demonstrations, and that too by persons not unacquainted with geometry and algebra, is truly astonishing. If a geometer, instead of designating the four angles of a square by four letters, were to call them *north, south, east, and west*, he would not render the demonstration of a theorem the easier; and the learner would be much more likely to be perplexed in the application of it.

It belongs, then, exclusively to a syllogism, properly so called, (i. e. a valid argument, so

stated that its conclusiveness is evident from the mere *form* of the expression,) that if letters, or any other unmeaning symbols, be substituted for the several terms, the validity of the argument shall still be evident. Whenever this is not the case, the supposed argument is either unsound and sophistical, or else may be reduced (without any alteration of its meaning) into the syllogistic form; in which form, the test just mentioned may be applied to it.

Detection
of unsound
arguments.

What is called an unsound or fallacious argument, i. e. an *apparent* argument, which is, in reality, none, cannot, of course, be reduced into this form; but when stated in the form most nearly approaching to this that is possible, its fallaciousness becomes more evident, from its nonconformity to the foregoing rule: e. g. "whoever is capable of deliberate crime is responsible; an infant is not capable of deliberate crime; therefore, an infant is not responsible:" here the term "responsible" is affirmed universally of "those capable of deliberate crime;" it might, therefore, according to Aristotle's dictum, have been affirmed of anything contained under that class; but in the instance before us nothing is mentioned as contained under that class; only the term "infant" is *excluded* from that class; and though what is affirmed of a whole class may be affirmed of anything that *is* contained un-

der it, there is no ground for supposing that it may be *denied* of whatever is *not* so contained; for it is evidently possible that it may be applicable to a whole class and to something else besides: to say, e. g. that all trees are vegetables, does not imply that *nothing else* is a vegetable. Nor, when it is said, that all who are capable of deliberate crime are responsible, does this imply, that no others are responsible; for though this may be very *true*, it has not been asserted in the premiss before us; and in the analysis of an argument, we are to discard all consideration of what *might* be asserted; contemplating only what *actually is* laid down in the premises. It is evident, therefore, that such an apparent argument as the above does not comply with the rule laid down, nor can be so stated as to comply with it, and is consequently invalid.

Again, in this instance, "food is necessary to life; corn is food; therefore, corn is necessary to life:" the term "necessary to life" is affirmed of food, but *not universally*; for it is not said of *every kind of food*: the meaning of the assertion being manifestly that *some* food is necessary to life: here again, therefore, the rule has not been complied with, since that which has been predicated, (i. e. affirmed or denied,) not of the *whole*, but of a *part* only of a certain class, cannot be, on that ground, pre-

licated of anything whatever which is contained under that class.

§ 5.

The fallacy in this last case is, what is usually described in logical language as consisting in the "non-distribution of the middle term:" i. e. its not being employed to denote *all* the objects to which it is applicable. In order to understand this phrase, it is necessary to observe, that a proposition being an expression in which one thing is affirmed or denied of another; e. g. "A is B," both that of which something is said, and that which is said of it, (i. e. both A and B,) are called "terms," from their being (in their nature) the extremes or *boundaries* of the proposition; and there are, of course, two, and but two, terms in a proposition; (though it may so happen that either of them may consist either of one *word*, or of several;) and a term is said to be "distributed," when it is taken universally, so as to stand for everything it is capable of being applied to; and consequently "undistributed," when it stands for a portion only of the things signified by it: thus, "*all* food," or *every* kind of food, are expressions which imply the distribution of the term "food;" "*some* food" would imply its non-distribution: and it is also to be observed, that the term of which, in one

Distribution
of terms.

premiss, something is affirmed or denied, and to which, in the other premiss, something else is referred as contained in it, is called the "middle" term in the syllogism, as standing *between* the other two, (viz. the two terms of the conclusion,) and being the medium of proof. Now it is plain, that if in each premiss a *part* only of this middle term is employed, i. e. if it be not at all distributed, no conclusion can be drawn. Hence, if, in the example formerly adduced, it had been merely stated that "*something*" (not "*whatever*," or "*everything*") "which exhibits marks of design, is the work of an intelligent author," it would not have followed, from the world's exhibiting marks of design, that that is the work of an intelligent author.

It is to be observed also, that the words "all" and "every," which mark the distribution of a term, and "some," which marks its non-distribution, are not always expressed: they are frequently understood, and left to be supplied by the context; e. g. "food is necessary:" viz. "*some* food;" "man is mortal;" viz. "*every* man." Propositions thus expressed are called by logicians "*indefinite*," because it is left undetermined by the form of the expression whether the "subject" (the term of which something is affirmed or denied being called the "subject" of the proposition, and that which is said of it, the "predicate") be

distributed or not. Nevertheless, it is plain, that in every proposition the subject either is, or is not, distributed, though it be not declared whether it is or not; consequently, every proposition, whether expressed indefinitely or not, must be either "universal" or "particular;" those being called universal, in which the predicate is said of the whole of the subject; (or, in other words, where the subject is distributed;) and those particular, in which it is said only of a part of the subject: e. g. "All men are sinful," is universal; "some men are sinful," particular: and this division of propositions is, in logical language, said to be according to their "*quantity*."

Quantity
and quality
of proposi-
tions.

But the distribution or non-distribution of the *predicate* is entirely independent of the *quantity* of the proposition; nor are the signs "all" and "some" ever affixed to the predicate; because its distribution depends upon, and is indicated by, the "*quality*" of the proposition; i. e. its being *affirmative* or *negative*; it being a universal rule, that the predicate of a negative proposition is distributed, and of an affirmative, undistributed^h. The reason of this

^h The learner may perhaps be startled at being told, that the predicate of an affirmative is *never* distributed; especially as Aldrich has admitted that accidentally this *may* take place; as in such a proposition as "all equilateral triangles are equiangular;" but this is not accurate: he might have said, that in such a proposition as the above the predicate is *distributable*,

may easily be understood, by considering that a term which stands for a whole class may be applied to (i. e. *affirmed* of) anything that is comprehended under that class, though the term of which it is thus affirmed may be of much narrower extent than that other, and may, therefore, be far from coinciding with the *whole* of it: thus it may be said with truth, that "the negroes are uncivilized," though the term "uncivilized" be of much wider extent than "negroes," comprehending, besides them, hottentots, etc.; so that it would not be allowable to assert, that "*all* who are uncivilized are negroes:" it is evident, therefore, that it is a *part* only of the term "uncivilized" that has been affirmed of "negroes:" and the same reasoning applies to every affirmative proposition; for though it may so happen that the subject and predicate coincide, i. e. are of equal extent, as, e. g. "all men are rational animals;" "all equilateral triangles are equiangular;" (it being equally true, that "all rational animals are men, and that all equiangular triangles are equilateral;") yet this is not *implied by the form of the expression*; since it would be no less true, that "all men are ra-

but not that it is actually distributed: i. e. it *so happens* that "all equiangular triangles are equilateral;" but this is *not implied* in the previous assertion; and the point to be considered is, not what *might be* said with truth, but what *actually has been* said.

tional animals," even if there were other rational animals besides man.

It is plain, therefore, that if *any part* of the predicate is applicable to the subject, it may be affirmed, and, of course, cannot be denied, of that subject; and consequently, when the predicate *is denied* of the subject, it is implied that *no part* of that predicate is applicable to that subject; i. e. that the *whole* of the predicate is denied of the subject: for to say, e. g. that "no beasts of prey ruminant," implies that beasts of prey are excluded from the *whole class* of ruminant animals, and, consequently, that "no ruminant animals are beasts of prey." And hence results the above-mentioned rule, that the distribution of the predicate is implied in negative propositions, and its non-distribution in affirmatives.

It is to be remembered, therefore, that it is not sufficient for the middle term to *occur* in a universal proposition; since if that proposition be an affirmative, and the middle term be the *predicate* of it, it will not be distributed: e. g. if in the example formerly given it had been merely asserted, that "all the works of an intelligent author show marks of design," and that "the universe shows marks of design," nothing could have been proved; since, though both these propositions are universal, the middle term is made the predicate in each, and both are affirmative; and accordingly, the rule

of Aristotle is not here complied with; since the term "work of an intelligent author," which is to be proved applicable to "the universe," would not have been affirmed of the middle term, ("what shows marks of design,") under which "universe" is contained; but the middle term, on the contrary, would have been affirmed of it.

If, however, one of the premises be negative, the middle term may then be made the predicate of that, and will thus, according to the above remark, be distributed: e. g. "no ruminant animals are predacious; the lion is predacious; therefore, the lion is not ruminant:" this is a valid syllogism; and the middle term (predacious) is distributed by being made the predicate of a negative proposition. The form, indeed, of the syllogism is not that prescribed by the dictum of Aristotle, but it may easily be reduced to that form, by stating the first proposition thus: "no predacious animals are ruminant;" which is manifestly implied (as was above remarked) in the assertion that "no ruminant animals are predacious." The syllogism will thus appear in the form to which the dictum applies.

It is not every argument, indeed, that can be reduced to this form by so short and simple an alteration as in the case before us: a longer and more complex process will often be required; and rules will hereafter be laid down

to facilitate this process in certain cases: but there is no sound argument but what *can* be reduced into this form, without at all departing from the real meaning and drift of it; and the form will be found (though more prolix than is needed for ordinary use) the most perspicuous in which an argument can be exhibited.

All reasoning whatever, then, rests on the one simple principle laid down by Aristotle, that "what is predicated, either affirmatively or negatively, of a term distributed, may be predicated in like manner (i. e. affirmatively or negatively) of anything contained under that term." So that when our object is to prove any proposition, i. e. to show that one term may rightly be affirmed or denied of another, the process which really takes place in our minds is, that we *refer* that term (of which the other is to be thus predicated) to some class (i. e. middle term) of which that other may be affirmed, or denied, as the case may be. Whatever the subject-matter of an argument may be, the reasoning itself, considered by itself, is in every case the same process; and if the writers against logic had kept this in mind, they would have been cautious of expressing their contempt of what they call "syllogistic reasoning," which is, in truth, *all* reasoning; and instead of ridiculing Aristotle's principle for its obviousness and simplicity, would have perceived that these are, in fact, its highest

praise : the easiest, shortest, and most evident theory, provided it answer the purpose of explanation, being ever the best.

§ 6.

If we conceive an inquirer to have reached, in his investigation of the theory of reasoning, the point to which we have now arrived, a question which would be likely next to engage his attention, is that of predication ; i. e. since in reasoning we are to find a middle term, which may be predicated affirmatively of the subject in question, we are led to inquire what terms may be affirmed, and what denied, of what others.

It is evident that proper names, or any other terms, which denote each but a single individual, as "Cæsar," "the Thames," "the conqueror of Pompey," "this river," (hence called in logic "singular terms,") cannot be affirmed of anything besides themselves, and are therefore to be denied of anything else : we may say, "this river is the Thames," or "Cæsar was the conqueror of Pompey ;" but we cannot say of anything else that it is the Thames.

Common
and singular
terms.

On the other hand, those terms which are called "common," as denoting any one individual of a whole class, as "river," "conqueror," may, of course, be affirmed of any, or all that belong to that class : as, "the Thames is a river ;" "the Rhine and the Danube are rivers."

Common terms, therefore, are called "predicables," (viz. *affirmatively* predicable,) from their capability of being affirmed of others : a singular term, on the contrary, may be the subject of a proposition, but never the predicate, unless it be of a negative proposition ; (as, e. g. the first-born of Isaac was not Jacob ;) or, unless the subject and predicate be only two expressions for the same individual object ; as in some of the above instances.

Abstraction
and gene-
ralization.

The process by which the mind arrives at the notions expressed by these "common" (or, in popular language, "general") terms, is properly called generalization ; though it is usually (and truly) said to be the business of *abstraction* ; for generalization is one of the purposes to which abstraction is applied : when we *draw off*, and *contemplate separately*, any part of an object presented to the mind, disregarding the rest of it, we are said to *abstract* that part. Thus a person might, when a rose was before his eyes or mind, make the scent a distinct object of attention, laying aside all thought of the colour, form, etc. ; and thus, even though it were the *only* rose he had ever met with, he would be employing the faculty of abstraction ; but if, in contemplating *several* objects, and finding that they agree in certain points, we abstract the circumstances of agreement, disregarding the differences, and give to all and each of these objects a name applicable to them in re-

spect of this agreement, i. e. a common name, (as "rose,") we are then said to generalize. Abstraction, therefore, does not necessarily imply generalization, though generalization implies abstraction.

Much needless difficulty has been raised respecting the results of this process; many having contended, and perhaps more having taken for granted, that there must be some really existing *thing*¹, corresponding to each of these general or common terms, and of which such term is the name, standing for and representing it; e. g. that as there is a really existing being corresponding to the proper name *Ætna*, and signified by it, so the common term "mountain," must have some one really existing thing corresponding to it, and, of course, *distinct* from each individual mountain, (since the term is not singular, but common,) yet existing *in* each, since the term is applicable to each of them. "When many different men," it is said, "are at the same time thinking or speaking about a mountain, i. e. not any particular one, but a mountain generally, their minds must be all employed on *something*; which must also be *one* thing, and not several, and yet cannot be any one individual:" and hence a vast train of mystical disquisitions about ideas, etc. has arisen, which are, at best, nugatory, and tend

¹ See the subjoined Dissertation, ch. v.

to obscure our view of the process which actually takes place in the mind.

The fact is, the notion expressed by a common term is merely an inadequate (or incomplete) notion of an individual; and from the very circumstance of its inadequacy, it will apply equally well to any one of several individuals: e. g. if I omit the mention and the consideration of every circumstance which distinguishes *Ætna* from any other mountain, I then form a notion (expressed by the common term mountain) which inadequately designates *Ætna*, (i. e. which does not imply any of its peculiarities,) and is equally applicable to any one of several other individuals.

Generalization, it is plain, may be indefinitely extended by a further abstraction applied to common terms: e. g. as by abstraction from the term *Socrates* we obtain the common term "philosopher;" so from "philosopher," by a similar process, we arrive at the more general term "man;" from "man," we advance to "animal," etc.

The employment of this faculty at pleasure has been regarded, and perhaps with good reason, as the characteristic distinction of the human mind from that of the brutes. We are thus enabled not only to separate, and consider singly, one part of an object presented to the mind, but also to fix arbitrarily upon whatever part we please, according as may suit the pur-

pose we happen to have in view : e. g. any individual person to whom we may direct our attention, may be considered either in a political point of view, and accordingly referred to the class of merchant, farmer, lawyer, etc. as the case may be ; or physiologically, as negro, or white man ; or theologically, as pagan or christian, papist or protestant ; or geographically, as European, American, etc. And so, in respect of anything else that may be the subject of our reasoning : we arbitrarily fix upon and abstract that point which is essential to the purpose in hand ; so that the same object may be referred to various different classes, according to the occasion. Not, of course, that we are allowed to refer anything to a class to which it does *not* really belong ; which would be pretending to abstract from it something that was *no* part of it ; but that we arbitrarily fix on *any part* of it which we choose to abstract from the rest. It is important to notice this, because men are often disposed to consider each object as really and properly belonging to some one class alone^k, from their having been accustomed, in the course of their own pursuits, to consider, in one point of view only, things which may with equal propriety be considered in other points of view also : i. e. referred to various classes, (or predicates.) And this is that which chiefly

^k See the subjoined Dissertation, ch. v.

Different
modes of
classification.

constitutes what is called narrowness of mind : e. g. a mere botanist might be astonished at hearing such plants as clover and lucerne included, in the language of a farmer, under the term "grasses," which he has been accustomed to limit to a tribe of plants widely different in all botanical characteristics ; and the mere farmer might be no less surprised to find the troublesome "weed," (as he has been accustomed to call it,) known by the name of couch grass, and which he has been used to class with nettles and thistles, to which it has no *botanical* affinity, ranked by the botanist as a species of wheat, (*triticum repens*.) And yet neither of these classifications is in itself erroneous or irrational ; though it would be absurd in a botanical treatise to class plants according to their agricultural use ; or in an agricultural treatise, according to the structure of their flowers.

The utility of these considerations, with a view to the present subject, will be readily estimated, by recurring to the account which has been already given of the process of reasoning ; the analysis of which shows, that it consists in referring the term we are speaking of to some class, viz. a middle term ; which term, again, is referred to or excluded from (as the case may be) another class, viz. the term which we wish to affirm or deny of the subject of the conclusion. So that the quality of our reasoning, in any case, must depend in our being able, cor-

rectly, clearly, and promptly, to *abstract* from the subject in question that which may furnish a middle term suitable to the occasion.

The imperfect and irregular sketch which has here been attempted, of the logical system, may suffice (even though some parts of it should not be at once fully understood by those who are entirely strangers to the study) to point out the general drift and purpose of the science, and to render the details of it both more interesting and more intelligible. The analytical form which has here been adopted, is, generally speaking, the best suited for *introducing* any science in the plainest and most interesting form; though the synthetical, which will henceforth be employed, is the most regular, and the most compendious form for storing it up in the memory.

CHAPTER II.

SYNTHETICAL COMPENDIUM.

PART I.—*Of the Operations of the Mind and of Terms.*

Operations
of the mind.

THERE are three operations of the mind which are concerned in argument: 1st. Simple Apprehension; 2d. Judgment; 3d. Discourse, or Reasoning^a.

Simple ap-
prehension.

1st. Simple apprehension is the notion (or conception) of any object in the mind, analogous to the perception of the senses. It is either incomplex or complex: incomplex apprehension is of one object, or of several without any *relation* being perceived between them, as of "a man," "a horse," "cards:" complex is

^a Logical writers have in general begun by laying down, that there are, *in all*, three operations of the mind: (*in universum* tres:) an assertion by no means incontrovertible, and which, if admitted, is nothing to the present purpose: our business is with *argumentation*, and the operations of the mind implied in that; what others there may be, or whether any, are irrelevant questions.

The opening of a treatise with a statement respecting the operations of the mind universally, tends to foster the prevailing error (from which probably the minds of the writers were not exempt) of supposing that logic professes to teach "the use of the mental faculties in general:"—the "right use of reason," according to Watts.

of several *with* such a relation, as of "a man on horseback," "a pack of cards."

2d. Judgment is the comparing together in Judgment. the mind two of the notions (or ideas) which are the objects of apprehension, whether complex or incomplex, and pronouncing that they *agree* or *disagree* with each other; (or that one of them *belongs* or does not belong to the other.) Judgment, therefore, is either *affirmative* or *negative*.

3d. Reasoning (or discourse) is the act of Discourse. proceeding from one judgment to another *founded* upon it, (or the result of it.)

§ 2.

Language affords the *signs* by which these Language. operations of the mind are expressed and communicated. An act of *apprehension* expressed in language, is called a *term*; an act of *judgment*, a *proposition*; an act of *reasoning*, an *argument*; (which, when regularly expressed, is a syllogism;) as, e. g.

Every dispensation of Providence is beneficial;
Afflictions are dispensations of Providence;
Therefore they are beneficial:

is a syllogism; (the act of reasoning being indicated by the word "*therefore*;") it consists of three *propositions*, each of which has (neces-

sarily) two *terms*, as “beneficial,” “dispensations of Providence^b,” etc.

Terms.
Proposi-
tions.
Syllogisms.

Language is employed for various purposes : e. g. the province of an historian is to *convey information*; of an orator, to *persuade*, etc. Logic is concerned with it only when employed for the purpose^c of *reasoning*, (i. e. in order to *convince*;) and whereas, in reasoning, *terms* are liable to be *indistinct*, (i. e. without any clear, determinate meaning,) *propositions*, to be *false*, and *arguments*, *inconclusive*, logic undertakes directly and completely to guard against *this last defect*, and, incidentally and in a certain degree, against the others, as far as can be done by the *proper use of language*: it is, therefore, (when regarded as an *art*^c), “the

^b In introducing the mention of *language* previously to the definition of logic, I have departed from established practice, in order that it may be clearly understood, that logic is *entirely conversant about language*: a truth which most writers on the subject, if indeed they were fully aware of it themselves, have certainly not taken due care to impress on their readers. Aldrich's definition of logic, for instance, does not give any hint of this.

^c It is to be observed, however, that as a *science* is conversant about *knowledge only*, an *art* is the *application* of knowledge to *practice*: hence logic (as well as any other system of knowledge) becomes, when applied to practice, an *art*; while confined to the *theory* of reasoning, it is strictly a *science*: and it is as such that it occupies the higher place in point of dignity, since it professes to develop some of the most interesting and curious intellectual phenomena. It is surely strange, therefore,

art of employing language properly for the purpose of reasoning." Its importance no one can rightly estimate who has not long and attentively considered how much our thoughts are influenced by expressions, and how much error, perplexity, and labour are occasioned by a faulty use of language. ▀

A syllogism being, as aforesaid, resolvable into three propositions, and each proposition containing two terms; of these terms, that which is spoken of is called the *subject*; that which is said of it, the *predicate*; and these two are called the *terms*, (or extremes,) because, logically, the subject is placed *first*, and the predicate *last*: and, in the middle, the copula, which indicates the act of judgment, as by it the predicate is affirmed or denied of the subject. It must be either IS or IS NOT; the substantive verb being the only *verb* recognised by logic: all others are resolvable by means of the verb "to be," and a participle or adjective; e. g. "the Romans conquered:" the word conquered is both copula and predicate, being equivalent to "*were* (cop.) *victorious*" (pred.^d)

to find in a treatise on logic, a distinct dissertation to prove that it is an art and *not* a science!

^d It is proper to observe, that the copula, as such, has no relation to *time*; but expresses merely the agreement or disagreement of two given terms: hence, if any other *tense* of the substantive verb, besides the present, is used, it is either to be understood as the same in sense, (the difference of tense being

§ 3.

It is evident, that a term may consist either of one word or of several; and that it is not every word that is capable of being employed by itself as a term; e. g. adverbs, prepositions, etc. and also nouns in any other case besides the nominative. A noun may be by itself a term; a verb (all except the substantive verb used as the copula) is resolvable into the copula and predicate, to which it is equivalent; and, indeed, is often so resolved in the mere rendering out of one language into another; as "*ipse adest*," "he is present." It is to be observed, however, that under "verb," we do not include the infinitive, which is properly a noun-substantive, nor the participle, which is a noun-adjective. They are *verbals*; being related to their respective verbs in respect of *the things they signify*; but not *verbs*, inasmuch as they differ entirely in their *mode of signification*. It is worth observing, that an infinitive (though it often comes last in the sentence) is *never the predicate*, except when another infinitive is the subject: e. g.

regarded as a matter of grammatical convenience only;) or else, if the circumstance of time really do *modify the sense* of the whole proposition, so as to make the use of that tense an essential, then this circumstance is to be regarded as a part of one of the terms: "*at that time*," or some such expression, being understood. Sometimes the substantive verb is both copula and predicate; i. e. where existence only is predicated: e. g. *Deus est*.

sub. pred.

"I hope to succeed:" i. e. "to succeed is what I hope."

It is to be observed also, that in English there are two infinitives, one in "*ing*," the same in sound and spelling as the participle present, from which, however, it should be carefully distinguished: e. g. "rising early is healthful," and "it is healthful to rise early," are equivalent. In this, and in many other cases, the English word *IT* serves as a *representative* of the subject when that is put last: e. g.

pred. sub.

"It is to be hoped that we shall succeed."

An adjective (including participles) cannot, by itself, be made the subject of a proposition; but is often employed as a predicate; as "Crassus was rich;" though some choose to consider some substantive as understood in every such case, (e. g. rich man,) and consequently do not reckon adjectives among simple terms; (i. e. words which are capable, singly, of being employed as terms.) This, however, is a question of no practical consequence.

Of simple terms, then, (which are what the Simple first part of logic treats of,) there are many divisions^f; of which, however, one will be sufficient

* Grammarians have produced much needless perplexity by speaking of the *participle* in "*ing*" being employed so and so; when it is manifest, that that very employment of the word constitutes it, to all intents and purposes, an *infinitive*, and not a *participle*.

^f The usual divisions of words, however, into *univocal*, *equivocal*, and *analogous*, and into words of the *first* and *second* in-

Singular
and com-
mon terms.

for the present purpose; viz. into *singular* and *common*; because, though any term whatever may be a *subject*, none but a *common* term can be affirmatively *predicated* of several others. A singular term stands for *one individual*, as "Cæsar," "the Thames;" (these, it is plain, cannot be said [or predicated] *affirmatively* of anything but themselves.) A common term stands for several individuals: i. e. can be *applied* to any of them, as comprehending them in its *single signification*; as "man," "river," "great^{s h}." "The notions expressed by these common terms, we are enabled to form by the faculty of *abstraction*: for by it, in contemplating any object (or objects) we can attend exclusively to some particular circumstances belonging to it, [some certain parts of its nature, as it were,] and quite withhold our attention from the rest.

tention, are not, strictly speaking, divisions of words, but divisions of the manner of employing them; the same word may be employed either univocally, equivocally, or analogously; either in the first intention or in the second. The ordinary logical treatises often occasion great perplexity to the learner, by not noticing this circumstance, but rather leading him to suppose the contrary.—See ch. iii. § 8.

^s These individuals are called its *significates*.

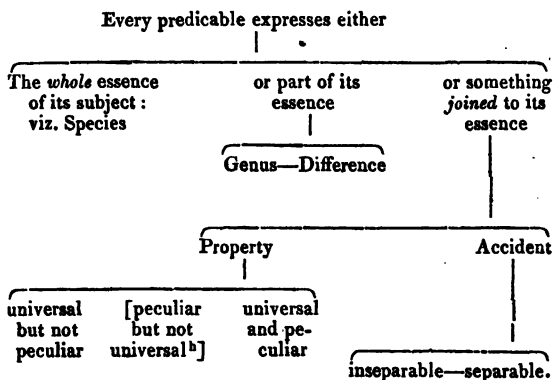
^h The learner is recommended to pass on to the Second Part of logic; the intermediate matter, although not the least important in itself, having no application to the proper object of the treatise—the construction and tests of the syllogism. At least, it is only requisite to understand so much of the doctrine of abstraction as explains the expression in Aristotle's dictum, that "whatever is predicated of a term distributed, is predicated of every thing contained under it. All this portion of logic requires a distinct treatise, which might properly be learnt before the student enters upon syllogistic logic.

When, therefore, we are thus contemplating several individuals which *resemble* each other in some *part* of their nature, we can (by attending to *that part alone*, and not to those points in which they differ,) assign them *one common name*, which will express or stand for them merely as far as they all *agree*; and which, of course, will be applicable to all or any of them; (which process is called *generalization*;) and each of these names is called a *common term*, from its belonging to them *all alike*; or a *predicable*, because it may be predicated affirmatively of them, or of any one of them." Generalization.
Predicables.

"Generalization (as has been remarked) implies abstraction, but it is not the same thing; for there may be abstraction without generalization: when we are speaking of an individual, it is usually an abstract notion that we form; e. g. suppose we are speaking of the present king of France; he must actually be either at Paris or elsewhere; sitting, standing, or in some other posture; and in such and such a dress, etc. Yet many of these circumstances, (which are *separable* accidents (vide § 7.) and consequently,) which are regarded as *non-essential to the individual*, are quite disregarded by us; and we *abstract* from them what we consider as essential; thus forming an *abstract* notion of the individual. Yet there is here no generalization."

§ 4.

- Species. " Whatever term can be affirmed of several things, must express either their *whole essence*, which is called the *species*; or a *part* of their essence, (viz. either the material part, which is called the *genus*, or the *formal* and *distinguishing part*, which is called *differentia*, or, in common discourse, *characteristic*,) or something *joined to the essence*; whether *necessarily*, (i. e. to the *whole* species, or, in other words, *universally*, to every individual of it,) which is called a *property*; or *contingently*, (i. e. to *some* individuals only of the species,) which is an *accident*.
- Genus.
- Differentia.
- Property.
- Accident.



^b And, consequently, not correctly called a property, as is remarked below; but inserted here as having been usually reckoned such by logical writers. They have also added a fourth

"It is evident from what has been said, that the genus and difference put together make up the species: e. g. "rational" and "animal" constitute "man;" so that, *in reality*, the species contains the genus; (i. e. implies it;) and when the genus is called a *whole*, and is said to *contain* the species, this is only a *metaphorical* expression, signifying that it *comprehends* the species, in its own more *extensive* signification: e. g. if I predicate of Cæsar that he is an *animal*, I say the truth indeed, but not the *whole* truth; for he is *not only* an animal, but a man; so that "man" is a more *full and complete* expression than "animal;" which for the same reason is more *extensive*, as it contains, (or rather comprehends,) and may be predicated of, several other species, viz. "beast," "bird,"

kind of property; viz. that which is peculiar to a species, and belongs to every individual of it, but *not at every time*. But this is, in fact, a contradiction; since whatever does not *always* belong to a species, does not belong to it *universally*. It is through the ambiguity of words that they have fallen into this confusion of thought; e. g. the example commonly given is, "homini canescere," "to become grey" being, they say, (though it is not,) *peculiar* to man, and belonging to *every* individual, though not *always*, but only in old age, etc. Now, if by "canescere" be meant the *very circumstance* of becoming grey, this manifestly does not belong to every man: if, again, it be meant to signify the *liability* to become grey hereafter, this does belong *always* to man. And the same in other instances. Indeed the very proprium fixed on by Aldrich, "risibility," is nearly parallel to the above. Man is *always* "*capable of laughing*;" but he is not "*capable of laughing always*."

etc. In the same manner the name of a *species* is a more *extensive*, but less *full and complete* term than that of an *individual*; (viz. a singular term;) since the species may be predicated of each of these. [Note, that genus and species are commonly said to be *predicated in quid* (τι) (i. e. to answer to the question "what?" as, "what is Cæsar?" Answer, "a man;" "what is a man?" Answer, "an animal.") Difference, in "*quale quid*;" (ποῖον τι) property and accident in *quale* (ποῖον).]"

§ 5.

Subaltern
genus and
species.

"A *genus, which is also a species*, is called a *subaltern* genus or species; as "bird," which is the genus of "pigeon," (i. e. of which "pigeon" is a species,) is itself a *species* of "animal." A genus which is *not* considered as a *species* of anything, is called *summum* (the highest) genus; a species which is *not* considered as a *genus* of anything, i. e. is regarded as containing under it only *individuals*, is called *infima* (the lowest) species.

"When I say of a magnet, that it is "a kind of *iron ore*," that is called its *proximum* genus, because it is the closest (or lowest) genus that can be predicated of it: "mineral" is its more *remote* genus.

"When I say that the differentia of a magnet is its "*attracting iron*," and that its property is "*polarity*," these are called respect-

ively a specific difference and property; because magnet is an *infima species* (i. e. *only a species*.)")

"When I say that the differentia of iron ore is its "*containing iron*," and its property "*being attracted by the magnet*," these are called respectively, a *generic* difference and property, because iron ore is a *subaltern* species or genus, being both the *genus* of *magnet*, and a *species* of *mineral*.

"That is the most strictly called a property, which belongs to the *whole* of a species, and to that species *alone*; as polarity to the magnet. [And such a *property* it is often hard to distinguish from the *differentia*; but whatever you consider as the most *essential to the nature* of a species, with respect to the matter you are engaged in, you must call the *differentia*; as "*rationality*" to "*man*;" and whatever you consider as rather an *accompaniment* (or result) of that difference, you must call the *property*; as the "*use of speech*" seems to be a result of rationality.] But very many properties which belong to the *whole* of a species are not peculiar to it; as, "*to breathe air*" belongs to every *man*, but not to man alone; and it is, therefore, strictly speaking, not so much a property of the species "*man*," as of the higher, i. e. more comprehensive, species, which is the genus of that, viz. of "*land animal*." Other properties, as some logicians call them, are *peculiar* to a

species, but do not belong to the whole of it: e. g. man *alone* can be a poet, but it is not *every* man that is so. These, however, are more commonly and more properly reckoned as *accidents*.

Accidents
separable
and inseparable.

"For that is most properly called an accident, which may be absent or present, the essence of the species continuing the same; as, for a man to be "*walking*," or a "*native of Paris*:" of these two examples, the former is what logicians call a *separable* accident, because it may be separated from the *individual*: (e. g. he may sit down:) the latter is an *inseparable* accident, being not separable from the individual, (i. e. he who is a native of Paris can never be otherwise;) "*from the individual*," I say, because *every accident* must be separable from the *species*, else it would be a *property*¹.

"Let it here be observed, that both the

¹ This seems to me a clearer and more correct description of the two kinds of accident than the one given by Aldrich; viz. that a separable accident may be *actually* separated, and an inseparable, only *in thought*, "*ut Mantuanum esse*, a Virgilio." For surely "to be the author of the *Æneid*" was another inseparable accident of the same individual; "to be a Roman citizen" another; and "to live in the days of Augustus" another: now can we *in thought* separate all these things from the essence of *that individual*? To do so would be to form the idea of a *different* individual. We can indeed conceive a *man*, and one who might chance to bear the *name* of Virgil, without any of these accidents; but then it would plainly not be the *same* man.

general name "predicable," and each of the classes of predicables, (viz. genus, species, etc.) are *relative*; i. e. we cannot say *what predicable* any term is, or whether it is any at all, unless it be specified *of what* it is to be predicated: e. g. the term "red" would be considered a *genus*, in relation to the terms "pink," "scarlet," etc. it might be regarded as the *differentia*, in relation to "red rose;"—as a *property* of "blood;"—as an *accident* of "a house," etc.

"And universally, it is to be steadily kept in mind, that no "common terms" have, as the names of individuals have, any *real thing existing in nature* corresponding to them ($\tau\acute{o}\delta\epsilon\ \tau\iota$, as Aristotle expresses it, though he has been represented as the champion of the opposite opinion: vide Categ. c. 3.) but that each of them is merely a name denoting a certain *inadequate notion* which our minds have formed of an individual, and which, consequently, not including anything wherein that individual differs from certain others, is applicable equally well to all or any of them: thus "man" denotes no real thing (as the sect of the realists maintained) distinct from each individual, but merely *any* man, viewed *inadequately*, i. e. so as to omit and abstract from, all that is peculiar to each individual; by which means the term becomes applicable alike to any one of several individuals, or (in the plural) to several

Different
modes of
classifica-
tion.

together; and we arbitrarily fix on the circumstance which we thus choose to abstract and consider separately, disregarding all the rest; so that the same individual may thus be referred to any of several different species, and the same species to several genera, as suits our purpose. Thus it suits the farmer's purpose to class his cattle with his ploughs, carts, and other possessions, under the name of "*stock*:" the naturalist, suitably to *his* purpose, classes them as "*quadrupeds*," which term would include wolves, deer, etc. which to the farmer would be a most improper classification: the commissary, again, would class them with corn, cheese, fish, etc. as "*provision*." That which is most essential in one view, being subordinate in another,

§ 6.

Division.

"An *individual* is so called because it is incapable of *logical division*; which is a metaphorical expression to signify "the distinct (i. e. separate) enumeration of several things signified by one common name." This operation is directly opposite to *generalization*, (which is performed by means of abstraction;) for as in that you *lay aside* the *differences* by which several things are distinguished, so as to call them all by one *common name*; so, in division, you *add on* the differences, so as to enumerate them by their *several particular* names.

Thus, "mineral" is said to be divided into "stones, metals," etc.; and metals again into "gold, iron," etc.; and these are called the parts (or members) of the division.

"The rules for division are three: 1st. each of the parts, or any of them short of *all*, must contain less (i. e. have a narrower signification) than the thing divided. 2d. All the parts together must be exactly equal to the thing divided; (therefore we must be careful to ascertain that the *summum genus* may be predicated of *every* term placed under it, and of nothing else.) 3d. The parts or members must be *opposed*; i. e. must not be contained in one another: e. g. if you were to divide "book" into "poetical, historical, folio, quarto, French, Latin," etc. the members would be contained in each other; for a French book may be a quarto, and a quarto French, etc. You must be careful, therefore, to keep in mind the *principle of division* with which you set out: e. g. whether you begin dividing books according to their *matter*, their *language*, or their *size*, etc. all these being so many *cross divisions*. And when anything is capable (as in the above instance) of being divided in several different ways, we are not to reckon one of these as the true, or real, or right one, without specifying what the object is which we have in view: for one mode of dividing may be the most suitable for one purpose, and another for another; as,

e. g. one of the above modes of dividing books would be the most suitable to a bookbinder; another in a philosophical, and the other in a philological view.

“ It must be carefully remembered, that the word “ division,” as employed in logic, is, as has been observed already, *metaphorical*; for to divide, means, originally and properly, to separate the component parts of anything; each of which is, of course, absolutely less than the whole: e. g. a tree (i. e. *any individual tree*) might be divided “ physically,” as it is called, into root, trunk, branches, leaves, etc. Now it cannot be said that a root or a leaf is a tree: whereas in a logical division each of the members is, in reality, *more* than the whole: e. g. if you divide tree (i. e. *the genus, tree*) into oak, elm, ash, etc. we may say of the oak, or of any individual oak, that “ it is a tree;” for by the very word “ oak,” we express not only the general notion of a tree, but *more*, viz. the peculiar characteristic (i. e. difference) of that kind of tree.

“ It is plain, then, that it is *logically* only, i. e. in our mode of speaking, that a genus is said to contain (or rather *comprehend*) its species; while metaphysically, i. e. in our conceptions, a species contains, i. e. *implies*, its genus.

“ Care must be taken not to confound a *physical* division with a *logical*; against which a caution is given under Rule 1, p. 51.

§ 7.

“*Definition* is another metaphorical word, Definition. which literally signifies, “laying down a boundary;” and is used in logic to signify “an expression which explains any term, so as to *separate* it from everything else,” as a boundary separates fields. A nominal definition (such as are those usually found in a *dictionary* of one’s own language) explains only the *meaning of the term*, by giving some equivalent expression, which may happen to be better known. Thus you might define a “term,” that which forms one of the *extremes* or *boundaries* of a “proposition;” and a “predicable,” that which may be predicated; “decalogue,” “ten commandments;” “telescope,” an instrument for viewing distant objects, etc. A real definition is one which explains and unfolds the *nature of the thing*; and each of these kinds of definition is either *accidental* or *essential*. An *essential* definition assigns (or lays down) the *constituent parts of the essence* (or nature.) An *accidental* definition (which is commonly called a *description*) assigns the circumstances *belonging* to the essence, viz. properties and accidents; (e. g. causes, effects, etc.) thus, “man” may be *described* as “an animal that uses fire to dress his food,” etc. [And here note, that Two divisions of definition. in *describing a species*, you cannot mention anything which is strictly an *accident*, because,

if it does not belong to the *whole* of the species, it cannot define it: in describing an *individual*, on the contrary, you enumerate the *accidents*, because by them it is that one individual differs from another; and in this case you add *the species*: e. g. "Philip was a *man* of Macedon, who subdued Greece," etc. Individuals, it is evident, can be defined in this way alone.]

"Lastly, the essential definition is divided into *physical* (i. e. natural) and *logical* or *metaphysical*: the *physical* definition lays down the *real parts of the essence* which are actually separable; the *logical* lays down the *ideal* parts of it, which cannot be separated except in the *mind*: thus, a plant would be defined *physically*, by enumerating the leaves, stalks, roots, etc. of which it is composed: *logically*, it would be defined "an organized being, destitute of sensation;" the former of these expressions denoting the *genus*, the latter the *difference*; for a *logical definition* must always consist of the *genus* and *differentia*, which are the parts of which logic considers everything as consisting, and which evidently are separable in the *mind alone*. Thus "man" is defined "a rational animal," etc. So also a "proposition" might be defined, physically, "a subject and predicate combined by a copula:" the parts here enumerated being actually separable; but logically it would be defined "a sen-

tence which affirms or denies;" and these two parts of the essence of a proposition (which are the *genus* and *differentia* of it) can be separated in the mind only. And note, that the difference is not always *one* quality, but is frequently *compounded* of several together, no one of which would alone suffice.

"Definitions are divided into nominal and real, according to the *object accomplished* by them; whether to explain merely the meaning of the word, or the nature of the thing: on the other hand, they are divided into accidental, physical, and logical, according to the *means employed* by each for accomplishing their respective objects; whether it be the enumeration of attributes, or of the physical, or the metaphysical parts of the essence. These, therefore, are evidently two cross divisions. In this place we are concerned with *nominal* definitions only, (except, indeed, of *logical terms*^k;) because all that is requisite for the purposes of *reasoning* (which is the proper province of logic) is, that a term shall not be used in *different senses*: a *real* definition of anything belongs to the science or system which is employed about that thing. It is to be noted, that in mathematics the nominal and real definition

^k The definitions of logical terms, as of all *terms of science* strictly so called, are at once nominal and real; the meaning of the word, and the nature of the thing, being in this case the very same. See Diss. ch. ii. § 3.

exactly coincide; the *meaning of the word*, and the *nature of the thing*, being exactly *the same*. This holds good also with respect to logical terms, most legal, and many ethical terms.

"It is scarcely credible how much confusion has arisen from the ignorance of these distinctions, which has prevailed among logical writers¹.

"The principal rules for definition are three; viz. 1st. The definition must be *adequate*; i. e. neither too extensive nor too narrow for the thing defined: e. g. to define "fish," "an animal that lives in the water," would be too *extensive*, because many insects, etc. live in the water; to define it, "an animal that has an air-bladder," would be too *narrow*; because many fish are without any.

2d. "The definition must be in itself plainer than the thing defined, else it would not *explain it*: I say "in itself," (i. e. generally,) because, to some particular person, the term defined may happen to be even more familiar

¹ In ch. ii. § 3. of the concluding dissertation, the doctrine here laid down will be more fully developed.

Aldrich having given as an instance of a nominal definition the absurd one of "homo, qui ex humo," has led some to conclude that the nominal definition must be founded on the *etymology*; or at least that such was his meaning; but that it was not, is sufficiently plain from the circumstance that Wallis (from whose work his is almost entirely abridged) expressly says the contrary. Be this as it may, however, it is plain that the etymology of a term has nothing to do with any logical consideration of it. See note to § 8. of ch. iii.

and better understood than the language of the definition.

3d. "It must be couched in a *convenient number* of *appropriate* words, (if such can be found suitable for the purpose,) for *figurative* words, (which are opposed to appropriate,) are apt to produce ambiguity or indistinctness; too great *brevity* may occasion *obscurity*; and too great *prolixity*, *confusion*."

PART II.—Of Propositions.

§ 1.

The second part of logic treats of the *proposition*; which is, "*Judgment expressed in words*."

A proposition is defined logically "*a sen-* Definition of proposition.
tence indicative," i. e. affirming or denying; (this excludes *commands* and *questions*.) "*Sentence*" being the *genus*, and "*indicative*" the *difference*, this definition expresses the whole essence; and it relates entirely to the *words* of a proposition. With regard to the *matter*, its property is, to be *true* or *false*. Hence it must not be *ambiguous*, (for that which has more than one *meaning*, is, in reality, *several* propositions,) nor *imperfect*, nor *ungramma-*

tical, for such an expression has no meaning at all.

Divisions of
proposi-
tions.

Since the *substance* (i. e. *genus*, or material part) of a proposition is, that it is a *sentence*; and since every *sentence*, (whether it be a *proposition* or not,) may be expressed either *absolutely*^m, or under an *hypothesis*ⁿ, on this we found the division of propositions according to their *substance*; viz. into *categorical* and *hypothetical*. And as *genus* is said to be *predicated in quid*, (what,) it is by the members of this division that we answer the question, *what* is this proposition? (*quæ est propositio*.) Answer, *categorical* or *hypothetical*.

Substance.

Categorical propositions are subdivided into *pure*, which asserts *simply* or *purely* that the subject does or does not agree with the predicate, and *modal*, which expresses in what *mode* (or manner) it agrees: e. g. "an intemperate man will be sickly;" "Brutus killed Cæsar;" are *pure*. "An intemperate man will *probably* be sickly;" "Brutus killed Cæsar *justly*;" are *modal*. At present we speak only of *pure categorical* propositions.

It being the *differentia* of a *proposition*, that it *affirms* or *denies*, and its *property* to be *true*

^m As, "Cæsar deserved death;" "did Cæsar deserve death?"

ⁿ As, "if Cæsar was a tyrant, what did he deserve?" "Was Cæsar a hero or a villain?" "If Cæsar was a tyrant, he deserved death;" "He was either a hero or a villain."

or *false*; and differentia being predicated in *quale quid*, property in *quale*, we hence form another division of propositions, viz. according to their *quality*, into *affirmative* and *negative*, Quality. (which is the *quality of the expression*, and therefore, in logic, *essential*,) and into *true* and *false*, (which is the quality of the *matter*, and therefore *accidental*.) An affirmative proposition is one whose *copula* is affirmative, as "birds fly;" "not to advance is to go back;" a negative proposition is one whose *copula* is negative, as, "man is not perfect;" "no miser is happy."

Another division of propositions is according Quantity. to their *quantity*, (or extent;) if the predicate is said of the *whole* of the subject, the proposition is *universal*: if of a *part* of it only, the proposition is *particular*, (or partial;) e. g. "England is an island;" "all tyrants are miserable;" "no miser is rich;" are *universal* propositions, and their subjects are therefore said to be *distributed*, being understood to stand, each, for *the whole* of its significates: but, "some islands are fertile;" "all tyrants are not assassinated;" are *particular*, and their subjects, consequently, not *distributed*, being taken to stand for a part only of their significates.

As every proposition must be either *affirmative* or *negative*, and must also be either *universal* or *particular*, we reckon, in all, four

kinds of pure categorical propositions, (i. e. considered as to their quantity and quality *both*;) viz. universal affirmative, whose symbol (used for brevity) is *A*; universal negative, *E*; particular affirmative, *I*; particular negative, *O*.

§ 2.

When the subject of a proposition is a common term, the *universal signs* ("all, no, every") are used to indicate that it is distributed, (and the proposition consequently is universal;) the *particular signs*, ("some," etc.) the contrary; should there be *no sign* at all to the common term, the quantity of the proposition (which is called an *indefinite* proposition) is ascertained by the *matter*; i. e. the nature of the connexion between the extremes; which is either necessary, impossible, or contingent. In necessary and in impossible matter, an indefinite is *understood as a universal*: e. g. "birds have wings;" i. e. *all*: "birds are not quadrupeds;" i. e. *none*: in contingent matter, (i. e. where the terms partly (i. e. sometimes) agree, and partly not,) an indefinite is understood as a particular; e. g. "food is necessary to life;" i. e. *some* food; "birds sing;" i. e. *some* do; "birds are not carnivorous;" i. e. *some* are not, or, all are not°.

° It is very perplexing to the learner, and needlessly so, to

As for *singular* propositions, (viz. those Singular. whose subject is either a *proper name*, or a common term with a *singular* sign,) they are reckoned as universals, (see ch. iv. § 2.) because in them we speak of the *whole* of the subject; e. g. when we say, "Brutus was a Roman," we mean the *whole* of Brutus: this is the general rule; but some singular propositions may fairly be reckoned *particular*; i. e. when some qualifying word is inserted, which indicates that you are not speaking of the *whole* of the subject; e. g. "Cæsar was not *wholly* a tyrant;" "this man is *occasionally* intemperate;" "non *omnis* moriar."

It is evident, that the *subject* is *distributed* in every universal proposition, and never in a *particular*; (that being the very difference between universal and particular propositions;) but the distribution or non-distribution of the *predicate*, depends (not on the *quantity*, but) on the *quality*, of the proposition; for, if any *part of the predicate* agrees with the subject, it must be *affirmed*, and not *denied*, of the subject; therefore, for an affirmative proposition to be true, it is *sufficient* that some *part of the predicate* agree with the subject; and, (for the

reckon *indefinites* as one class of propositions in respect of quantity. They must be either universal or particular, though it is not declared which. Such a mode of classification resembles that of some grammarians, who, among the genders, enumerate the *doubtful gender*!

same reason,) for a negative to be true, it is necessary that the *whole* of the predicate should *disagree* with the subject: e. g. it is true that "learning is useful," though the whole of the term "useful" does not agree with the term "learning," (for many things are useful besides learning,) but "no vice is useful," would be false, if any part of the term "useful" agreed with the term "vice;" (i. e. if you could find any one useful thing which was a vice.) The two practical rules then to be observed respecting distribution, are,

1st. All universal propositions (and no particular) distribute the *subject*.

2d. All *negative* (and no affirmative) the predicate.

It *may happen*, indeed, that the whole of the predicate in an affirmative may agree with the subject; e. g. it is equally true, that "all men are rational animals;" and "all rational animals are men:" but this is merely *accidental*, and is not at all *implied* in the *form of expression*, which alone is regarded in logic.

Of Opposition.

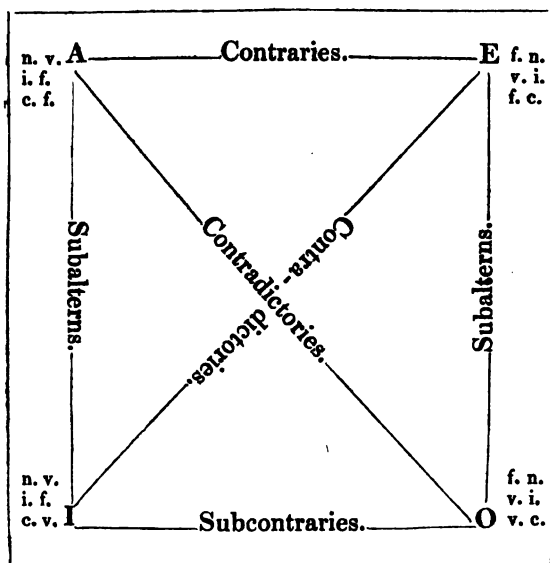
§ 3.

Two propositions are said to be *opposed* to each other, when, having the same subject and predicate, they differ in *quantity*, or *quality*, or *both*. It is evident, that with any given sub-

ject and predicate, you may state four distinct propositions, viz. A, E, I, and O; any two of which are said to be *opposed*; hence there are four different kinds of opposition, viz. 1st. Contraries. the two universals (A and E) are called *con-* Subcontra-
traries to each other; 2d. the two particular, Contradic-
 (I and O,) *subcontraries*; 3d. A and I, or E and tories.
 O, *subalterns*; 4th. A and O, or E and I, *con-* Subalterns.
tradictories.

As it is evident, that the truth or falsity of any proposition (its quantity and quality being known) must depend on the *matter* of it, we must bear in mind, that "*in necessary matter all affirmatives are true, and negatives false; in impossible matter, vice versa; in contingent matter, all universals are false, and particulars true;*" e. g. "*all islands (or, some islands) are surrounded by water,*" must be true, because the *matter is necessary*: to say, "*no islands, or some—not,*" etc. would have been false: again, "*some islands are fertile,*" "*some are not fertile,*" are both true, because it is contingent matter: put "*all*" or "*no,*" instead of "*some,*" and the propositions will be false. Hence it will be evident, that contraries will be *both false* in contingent matter, but never *both true*: subcontraries, *both true* in contingent matter, but never *both false*: contradictories, always *one true and the other false*, etc. with other observations, which will be immediately made on viewing the scheme; in which the four propo-

sitions are denoted by their symbols, the different kinds of *matter* by their initials, n, i, c, and the *truth* or *falsity* of each proposition in each matter, by the letter v. for (*verum*) true, f. for (*falsum*) false.



By a careful study of this scheme, bearing in mind, and applying the above rule concerning *matter*, the learner will easily elicit all the maxims relating to opposition; as that, in the subalterns, the truth of the particular (which is called the *subalternate*) follows from the truth of the universal, (*subalternans*,) and the falsity

of the universal from the falsity of the particular: that subalterns differ in *quantity alone*; contraries, and also subcontraries, in *quality alone*; contradictories, in both: and hence, that if any proposition is known to be true, we infer that its contradictory is false; if false, its contradictory true, etc.

Of Conversion.

§ 4.

A proposition is said to be *converted* when its terms are *transposed*: when nothing more is done, this is called *simple* conversion. No conversion is employed for any logical purpose, unless it be *illative*; i. e. *when the truth of the converse follows from the truth of the exposita*, (or proposition given;) e. g.

No virtuous man is a rebel; *therefore*,

No rebel is a virtuous man.

Some boasters are cowards; *therefore*,

Some cowards are boasters.

Conversion can then only be illative when Illative conversion.
no term is distributed in the converse, which was not distributed in the exposita: (for if that be done, you will employ a term *universally* in the converse, which was only used *partially* in the exposita.) Hence, as E distributes both terms, and I neither, these propositions may be illa-

Conversion
per acci-
dens.

tively converted in the simple manner; (vide Rule 2.) But as A does not distribute the predicate, its simple conversion would not be illative; (e. g. from "all birds are animals," you cannot infer that "all animals are birds;") as there would be a term distributed in the converse, which was not before. We must therefore *limit its quantity* from universal to particular, and the conversion will be illative; (e. g. "some animals are birds;") this might be fairly named conversion by *limitation*; but is commonly called "*conversion per accidens*." E may thus be converted also. But in O, whether the quantity be changed or not, there will still be a term (the predicate of the converse) distributed, which was not before: you can therefore only convert it illatively, by changing the quality; i. e. considering the negative as attached to the *predicate instead of to the copula*, and thus regarding it as I. One of the terms will then not be the same as before; but the proposition will be equipollent; (i. e. convey the same meaning;) e. g. "some members of the university are not learned:" you may consider "*not-learned*" as the predicate, instead of "*learned*;" the proposition will then be I, and of course may be simply converted, "some who are not learned are members of the university." This may be named conversion by *negation*; or, as it is commonly called, by *con-*

tra-position^p. A may also be fairly converted Contra-po-
sition.
in this way; e. g.

Every poet is a man of genius ; *therefore*,
He who is not a man of genius is not a poet :
(or, None but a man of genius can be a poet ;
or, A man of genius alone can be a poet.)

For (since it is the same thing, to *affirm* some attribute of the subject, or to *deny* the *absence* of that attribute) the original proposition is precisely equipollent to this,

subj.	pred.
<div style="display: flex; justify-content: center; align-items: center;"> <div style="border-top: 1px solid black; width: 150px; margin-right: 10px;"></div> <div style="border-top: 1px solid black; width: 150px;"></div> </div>	
No poet is not-a-man-of-genius ;	

which, being E, may of course be simply converted. Thus, in one of these three ways, every proposition may be illatively converted: viz. E, I, *simply*; A, O, *by negation*; A, E, *limitation*.

Note, that as it was remarked that, in some affirmatives, the whole of the predicate does actually agree with the subject, so, when this is the case, and is granted to be so, A may be illatively converted, simply; but this is an accidental circumstance. In a *just definition*, this is always the case; for there the terms being *exactly equivalent*, (or, as they are called, *con-*

^p No mention is made by Aldrich of this kind of conversion; but it has been thought advisable to insert it, as being in frequent use, and also as being employed in this treatise for the direct reduction of Baroko and Bokardo.

vertible terms,) it is no matter which is made the subject, and which the predicate; e. g. "a good government is that which has the happiness of the governed for its object:" if this be a *right definition*, it will follow that "a government which has the happiness of the governed for its object is a good one." Most propositions in mathematics are of this description: e. g.

All equilateral triangles are equiangular; and
All equiangular triangles are equilateral.

Examples for Practice.

1. The world is not eternal.
2. All mankind are sinful.
3. No plant is without seed.
4. Some virtuous men are disagreeable companions.
5. Sometimes excellence is the result of accident.
6. Some men's talents are never discovered.
7. A tyrant is likely to be a coward.
8. A soldier will probably acquire a habit of obedience.

9. Learned men are not always wise.

10. All is not gold that glitters.

11. Persons of great sensibility are scarcely ever happy.

12. Most pursuits are disagreeable to some.

13. Not a few have more ambition than industry.

14. John is a useful servant.

15. This country is very populous.

16. It is good for us to be here.

17. To err is human.

18. It is rather surprising, that Christianity should have existed now for more than 1800 years, and that mankind should not be more improved by it than they are.

19. That all mankind are descended from a single pair, is a fact clearly proved to be not inconsistent with the difference of colour and other distinctions which obtain among the various inhabitants of the earth.

20. Of the four evangelists, Matthew and John only were apostles.

In practising with these propositions, ask yourself the following questions.

I. What is the subject, what is the predicate, and what the copula?

II. The quantity and quality?

III. The contrary, contradictory, etc.?

IV. The converse?

Second Series of Examples.

State separately the several propositions contained in the following paragraphs; and mark the quantity and quality of each.

“ It is certain, Homer and Virgil are full of imaginary persons; who are very beautiful in poetry, when they are just shown, without being engaged in any series of action. Homer indeed represents Sleep as a person, and ascribes a short part to him in his *Iliad*; but we must consider, that, though we now regard such a person as entirely shadowy and unsubstantial, the heathens made statues of him, placed him in their temples, and looked upon him as a real deity. When Homer makes use of other such allegorical persons, it is only in short expressions, which convey an ordinary thought to the mind in the most pleasing manner, and may rather be looked upon as

poetical phrases, than allegorical descriptions. Instead of telling us that men naturally fly when they are terrified, he introduces the persons of Flight and Fear, who, he tells us, are inseparable. Instead of saying that the time was come when Apollo ought to have received his recompence, he tells us, that the Hours brought him his reward. Instead of describing the effects which Minerva's ægis produced in battle, he tells us, that the brims of it were encompassed by Terror, Rout, Discord, Fury, Pursuit, Massacre, and Death."

PART III.—Of Arguments.

§ 1.

The third operation of the mind, viz. *reasoning*, (or discourse,) expressed in words, is *argument*; and an argument stated *at full length*, and in its *regular form*, is called a *sylllogism*: the third part of logic, therefore, treats of the *sylllogism*. Every argument^a consists of two parts; that which *is proved*, and that *by means of which* it is proved: the former is called,

^a I mean, in the strict technical sense; for in popular use the word argument is often employed to denote the latter of these two parts alone: e. g. "this is an *argument* to prove so and so;" "this conclusion is established by the *argument*," i. e. premises.

before it is proved, the *question*; *when* proved, the *conclusion* (or *inference*;) that which is used to prove it, if stated *last*, (as is often done in *common discourse*,) is called the *reason*, and is introduced by "*because*," or some other *causal* conjunction; e. g. "Cæsar deserved death, *because* he was a tyrant, and all tyrants deserve death." If the conclusion be stated *last*, (which is the strict *logical form*, to which all reasoning may be reduced,) then that which is employed to prove it is called the *premises*^r; and the conclusion is then introduced by some *illative* conjunction, as "*therefore*;" e. g.

All tyrants deserve death;
Cæsar was a tyrant;
therefore he deserved death^s.

^r Both the premises together are sometimes called the *antecedent*.

^s It may be observed, that the definition here given of an *argument* is in the common treatises of logic laid down as the definition of a *syllogism*; a word which I have confined to a more restricted sense. There cannot evidently be any *argument*, whether regularly or irregularly expressed, to which the definition given by Aldrich, for instance, would not apply; so that he appears to employ "*syllogism*" as synonymous with "*argument*." But besides that it is clearer and more convenient, when we have these two words at hand, to employ them in the two senses respectively which we want to express, the truth is, that in so doing I have actually conformed to Aldrich's *practice*; for he generally, if not always, employs the term *syllogism* in the very sense to which I have confined it, viz. to denote an argument *stated in regular logical form*; as, e. g. in a part of his work, (omitted in the late editions,) in which he is objecting to

Since, then, an argument is an expression in which "*from something laid down and granted as true (i. e. the premises) something else (i. e. the conclusion) beyond this must be admitted to be true, as following necessarily (or resulting) from the other*;" and since logic is wholly concerned in the use of language, it follows that a syllogism (which is an argument stated in a regular logical form) must be "an argument so expressed, that the conclusiveness of it is manifest from *the mere force of the expression*," i. e. without considering the *meaning of the terms*: e. g. in this syllogism, "Y is X, Z is Y, therefore Z is X;" the conclusion is inevitable, whatever terms X, Y, and Z, respectively are understood to stand for. And to this form all legitimate arguments may ultimately be brought.

Definition
of argu-
ment.

Definition
of syllo-
gism.

§ 2.

The rule or axiom (commonly called "*dictum de omni et nullo*") by which Aristotle proves the validity of this argument is this: "*whatever is predicated of a term distributed, whether affirmatively or negatively, may be predicated*

a certain pretended syllogism in the work of another writer, he says, "*valet certe argumentum; syllogismus tamen est falsissimus*," etc. Now, (waving the exception that might be taken at this use of "*falsissimus*," nothing being, strictly, true or false but a *proposition*,) it is plain that he limits the word "syllogism" to the sense in which it is here defined, and is consequently inconsistent with his own definition of it.

in like manner of everything contained under it." Thus, in the examples above, X is predicated of Y distributed, and Z is contained under Y; (i. e. is its subject;) therefore X is predicated of Z: so "all tyrants," etc. (p. 72.) This rule may be *ultimately* applied to all arguments; (and their validity ultimately rests on their conformity thereto;) but it cannot be *directly and immediately* applied to *all* even of pure *categorical* syllogisms; for the sake of brevity, therefore, some other axioms are commonly applied in practice, to avoid the occasional tediousness of reducing all syllogisms to that form in which Aristotle's *dictum* is applicable[†].

We will speak first of pure categorical syllogisms, and the axioms or canons by which

[†] Instead of following Aldrich's arrangement, in laying down first the canons which apply to *all* the figures of categorical syllogisms, and then going back to the "dictum of Aristotle," which applies to only one of them, I have pursued what appears a simpler and more philosophical arrangement, and more likely to impress on the learner's mind a just view of the science; viz. 1st. to give the rule (Aristotle's dictum) which applies to the most clearly and regularly constructed argument, the syllogism in the first figure, to which all reasoning may be reduced; then, the canons applicable to all categoricals; then, those belonging to the hypotheticals; and lastly, to treat of the sorites; which is improperly placed by Aldrich *before* the hypotheticals. By this plan the province of strict logic is extended as far as it can be; every kind of argument which is of a *syllogistic* character, and accordingly directly cognizable by the rules of logic, being enumerated in natural order.

their validity is to be proved: viz. first, *if two terms agree with one and the same third, they agree with each other*: secondly, *if one term agrees and the other disagrees with one and the same third, these two disagree with each other*. On the former of these canons rests the validity of *affirmative* conclusions; on the latter, of *negative*: for no categorical syllogism can be faulty which does not violate these canons; none correct which does: hence on these two canons are built the rules or cautions which are to be observed with respect to syllogisms, for the purpose of ascertaining whether those canons have been strictly observed or not.

1st. *Every syllogism has three, and only three, terms*: viz. the two terms (or *extremes*, as they are commonly called) of the conclusion, (or question,) whereof, 1st, the *subject* is called the *minor term*; 2nd, the *predicate*, the *major*; and 3rd, the *middle term*, with which each of them is separately compared, in order to judge of their agreement or disagreement with each other. If, therefore, there were *two* middle terms, the *extremes*, (or *terms of the conclusion*,) not being both compared to the *same*, could not be conclusively compared to each other.

2d. *Every syllogism has three, and only three, propositions*; viz. 1st, the *major premiss*, in which the *major term* is compared with the *middle*: 2nd, the *minor premiss*, in which the

minor term is compared with the *middle*; and 3rd, the conclusion, in which the *minor term* is compared with the *major*.

3d. Note, that *if the middle term is ambiguous, there are, in reality, two middle terms, in sense, though but one in sound*. An ambiguous middle term is either an *equivocal term*, used in different senses in the two premises; (e. g.

Light is contrary to darkness;
Feathers are *light*; therefore
Feathers are contrary to darkness.)

Or a term *not distributed*: for as it is then used to stand for a *part* only of its *significates*, it may happen that one of the extremes may have been compared with *one part* of it, and the other with another part of it; e. g.

White is a colour,
Black is a colour; therefore
Black is white.—Again,
Some animals are beasts,
Some animals are birds; therefore
Some birds are beasts.

The middle term, therefore, must be distributed once, at least, in the premises; (i. e. by being the subject of an universal, or predicate of a negative, part ii. § 2. p. 60.) and once is sufficient; since if one extreme has been compared to a part of the middle term, and another

to the *whole* of it, they must have been both compared to the *same*.

4th. *No term must be distributed in the conclusion which was not distributed in one of the premises*; for that (which is called an *illicit* process, either of the major or the minor term) would be to employ the *whole* of a term in the conclusion, when you had employed only a *part* of it in the premiss; and thus, in reality, to introduce a fourth term; e. g.

All quadrupeds are animals;

A bird is not a quadruped: therefore

It is not an animal.—Illicit process of the major.

5th. *From negative premises you can infer nothing*. For in them the middle is pronounced to *disagree with both extremes*; not to *agree with both*; or to agree with one, and *disagree* with the other; therefore they cannot be compared together; e. g.

A fish is not a quadruped;

A bird is not a quadruped, proves nothing.

6th. *If one premiss be negative, the conclusion must be negative*; for in that premiss the middle term is pronounced to disagree with one of the extremes, and in the other premiss (which, of course, is affirmative by the preceding rule) to agree with the other extreme; therefore, the extremes disagreeing with each other, the conclusion is negative. In the same manner it may be shown, that *to prove a nega-*

ting conclusion one of the premises must be a negative.

By these six rules^u all syllogisms are to be tried; and from them it will be evident, 1st, that *nothing can be proved from two particular premises*; for you will then have *either the middle term undistributed, or an illicit process*; e. g.

Some animals are sagacious;
Some beasts are not sagacious:
Some beasts are not animals.

And, for the same reason, 2ndly, that if one of the premises be particular, the conclusion must be particular; e. g.

All who fight bravely deserve reward;
Some soldiers fight bravely; you can only infer
that Some soldiers deserve reward:

for to infer a universal conclusion, would be an illicit process of the minor. But from two universal premises you cannot always infer a universal conclusion; e. g.

All gold is precious;
All gold is a mineral: therefore
Some mineral is precious*.

^u Aldrich has given twelve rules, which I found might more conveniently be reduced to six. No syllogism can be faulty which violates none of these six rules. It is much less perplexing to a learner not to lay down as a distinct rule that, e. g. against *particular premises*; which is properly a *result* of the foregoing; since a syllogism with two particular premises would offend against either R. 3. or R. 4.

* Aldrich, by a strange oversight, has so expressed himself as

And even when we *can* infer a universal, we are always *at liberty* to infer a particular; since what is predicated of *all* may, *of course*, be predicated of some.

Of Moods.

§ 3.

When we designate the three propositions of a syllogism in their order, according to their respective quantity and quality, (i. e. their *symbols*,) we are said to determine the *mood* of the syllogism; e. g. the example just above, “all gold,” etc. is in the mood A, A, I. As there are four kinds of propositions, and three propositions in each syllogism, all the possible ways of combining these four, (A, E, I, O,) by threes, are sixty-four. For any one of these four may be the major premiss, each of these four majors may have four different minors, and of these sixteen pairs of premises, each may have four different conclusions. $4 \times 4 (=16) \times 4 = 64$. This is a mere arithmetical calculation of the moods, without any regard to the logical rules: for many of these moods are inadmissible in practice, from violating some of those rules; e. g. the mood E, E, E, must be rejected, as having *negative premises*; I, O, O,

to imply (though he could hardly mean it) that we always *may*, if we will, infer a universal conclusion from two universal premises.

for *particular premises*; and many others for the same faults. By examination, then, of all, it will be found that, of the sixty-four, there remain but twelve moods which can be used in a legitimate syllogism, viz. A, A, A, A, A, I, A, E, E, A, E, O, A, I, I, A, O, O, E, A, E, E, A, O, E, I, O, I, A, I, I, E, O, O, A, O.

Of Figure.

§ 4.

The figure of a syllogism consists in the situation of the middle term with respect to the extremes of the conclusion, (i. e. *the major and minor term*.) When the middle term is made the *subject of the major premiss, and the predicate of the minor*, that is called the first figure; (which is far the most natural and clear of all, as to this alone Aristotle's dictum may be *at once* applied.) In the second figure the middle term is the *predicate of both* premises: in the third, *the subject of both*: in the fourth, the *predicate of the major premiss, and the subject of the minor*. (This is the most awkward and unnatural of all, being the very reverse of the first.) Note, that the *proper order* is to place the major premiss first, and the minor *second*; but this does not *constitute* the major and minor premises; for that premiss (wherever placed) is the major, which *contains the major term*, and the minor, the minor, (v. R. 2. p. 75.)

Each of the allowable moods mentioned above will not be allowable in every figure; since it may violate some of the foregoing rules, in one figure, though not in another: e. g. I, A, I, is an allowable mood in the third figure; but in the first, it would have an *undistributed middle*. So A, E, E, would in the first figure have an *illicit process of the major*, but is allowable in the second; and A, A, A, which in the first figure is allowable, would in the third have an *illicit process of the minor*: all which may be ascertained by trying the different moods in each figure, as per scheme.

Let X represent the major term, Z the minor, Y the middle.

1st Fig.	2d Fig.	3d Fig.	4th Fig.
Y, X,	X, Y,	Y, X,	X, Y,
Z, Y,	Z, Y,	Y, Z,	Y, Z,
Z, X,	Z, X,	Z, X,	Z, X.

The terms alone being here stated, the *quantity and quality* of each proposition (and consequently the mood of the whole syllogism) is left to be filled up: i. e. between Y and X, we

e. g. $\overbrace{\text{Some restraint is salutary}}^A$: $\overbrace{\text{all restraint is unpleasant}}^I$:
 $\overbrace{\text{something unpleasant is salutary}}^I$. Again : $\overbrace{\text{some herbs are fit}}^I$
 $\overbrace{\text{for food}}^A$: $\overbrace{\text{nightshade is an herb}}^I$: $\overbrace{\text{some nightshade is fit for food}}^I$.

may place either a negative or affirmative copula; and we may prefix either a *universal* or *particular* sign to Y. By applying the moods then to each figure, it will be found that each figure will admit six moods only, as not violating the rules against *undistributed middle*, and against *illicit process*: and of the moods so admitted, several (though valid) are *useless*, as having a particular conclusion, when a *universal* might have been drawn; e. g. A, A, I, in the first figure,

All human creatures are entitled to liberty;
All slaves are human creatures: therefore
Some slaves are entitled to liberty.

Of the twenty-four moods, then, (six in each figure,) five are for this reason neglected: for the remaining nineteen, logicians have devised names to distinguish both the mood itself, and the figure in which it is found; since when one mood (i. e. *one in itself*, without regard to figure) occurs in two different figures, (as E, A, E, in the first and second,) the mere letters denoting the *mood* would not inform us concerning the *figure*. In these names, then, the *three vowels* denote the propositions of which the syllogism is composed; the consonants (besides their other uses, of which hereafter) serve to keep in mind the figure of the syllogism.

Fig. 1. bArbArA, cElArEnt, dArII, fErIOque
prioris.

Fig. 2. cEsArE, cAmEstrEs, fEstInO, bArO-
kO², secundæ.

Fig. 3. { tertia, dArAptI, dIsAmIs, dAtIsI, fEl-
AptOn, bOkArdO², fErIsO, habet:
quarta insuper addit.

Fig. 4. brAmAntIp, cAmEnEs, dImArIs, fE-
sApO, frEsIsOn.

By a careful study of these mnemonic lines, (which must be committed to memory,) you will perceive that A can only be proved in the first figure, in which also every other proposition may be proved; that the second proves only *negatives*; the third only *particulars*, etc.; with many other such observations, which will readily be made, (on trial of several syllogisms, in different moods,) and the reasons for which will be found in the foregoing rules: e. g. to show why the second figure has only negative conclusions, we have only to consider, that in it the middle term being the *predicate in both premises*, would not be *distributed* unless one premiss were *negative*; (v. R. 2. p. 51.) therefore the conclusion must be negative also, by R. 6. p. 77. One mood in each figure may suffice in this place by way of example:

First, *Barbara*, viz. (bAr.) Every Y is X;
(bA) every Z is Y; therefore (rA) every Z is

² Or, Fakoro, see § 7.

² Or, Dokamo, see § 7.

X: e. g. let the major term (which is represented by **X**) be "one who possesses all virtue;" the minor term (**Z**) "every man who possesses one virtue;" and the middle term, (**Y**), "every one who possesses prudence;" and you will have the celebrated argument of Aristotle, *Eth.* sixth book, to prove that the virtues are inseparable; viz.

He who possesses prudence, possesses all virtue;
 He who possesses one virtue, must possess prudence; therefore
 He who possesses one, possesses all.

Second, *Camestres*, (*cAm*) every **X** is **Y**; (*Es*) no **Z** is **Y**; (*trES*) no **Z** is **X**. Let the major term (**X**) be "true philosophers," the minor, (**Z**), "the Epicureans;" the middle, (**Y**), "reckoning virtue a good in itself;" and this will be part of the reasoning of Cicero, *Off.* book first and third, against the Epicureans.

Third, *Darapti*, viz. (*dA*) every **Y** is **X**; (*rAp*) every **Y** is **Z**; therefore, (*tI*), some **Z** is **X**: e. g.

Prudence has for its object the benefit of individuals; but prudence is a virtue; therefore, some virtue has for its object the benefit of the individual,

is part of Adam Smith's reasoning (*Moral Sentiments*) against Hutcheson and others, who placed all virtue in benevolence.

Fourth, *Camenes*, viz. (*cAm*) every **X** is **Y**;

(*En*) no Y is Z; therefore (*Es*) no Z is X:
e. g.

Whatever is expedient, is conformable to nature;
Whatever is conformable to nature, is not hurtful
to society: therefore

What is hurtful to society is never expedient,

is part of Cicero's argument in Off. third book; but it is an inverted and clumsy way of stating what would much more naturally fall into the first figure; for if you examine the propositions of a syllogism in the fourth figure, *beginning* at the *conclusion*, you will see that as the major term is predicated of the minor, so is the minor of the middle, and that again of the major: so that the major appears to be merely *predicated of itself*. Hence the five moods in this figure are seldom or never used; some one of the fourteen (*moods with names*) in the first three figures, being the forms into which all arguments may most readily be thrown; but of these, the four in the first figure are the clearest and most natural; as to them Aristotle's dictum will *immediately* apply. And as it is on this dictum that all reasoning *ultimately* depends, so all arguments may be somehow or other brought into some one of these four moods; and a syllogism is, in that case, said to be *reduced*: (i. e. to the first figure.) These four are called the *perfect* moods, and all the rest *imperfect*.

Ostensive Reduction.

§ 5.

In reducing a syllogism, we are not, of course, allowed to introduce any new term or proposition, having nothing granted but the truth of the premises; but these premises are allowed to be *illatively converted*, (because the truth of any proposition *implies* that of its illative converse,) or *transposed*: by taking advantage of this liberty, where there is need, we deduce (in figure 1st,) from the premises originally given, either the *very same conclusion* as the original one, or another from which the *original conclusion* follows, by illative conversion; e. g. *Darapti*.

All wits are dreaded;
 All wits are admired:
 Some who are admired are dreaded.

Into *Darii*, by converting by limitation (*per accidens*) the minor premiss.

All wits are dreaded;
 Some who are admired are wits: therefore
 Some who are admired are dreaded.

Camestres.

All true philosophers account virtue a good in itself;

The advocates of pleasure do not account, etc.
Therefore they are not true philosophers.

Reduced to *Celarent*, by simply converting the
minor, and then transposing the premises.

Those who account virtue a good in itself, are
not advocates of pleasure ;

All true philosophers account virtue, etc. : there-
fore

No true philosophers are advocates of pleasure.

This conclusion may be *illatively converted*
into the original one.

Baroko^b ; e. g.

Every true patriot is a friend to religion ;

Some great statesmen are not friends to religion :

Some great statesmen are not true patriots.

To *Ferio*, by converting the major *by negation*,
(contraposition,) vide Ch. II. § 4.

He who is not a friend to religion, is not a true
patriot ;

Some great statesmen, etc.

and the rest of the syllogism remains the same ;
only that the minor premiss must be considered
as affirmative, because you take " not-a-friend-
to-religion " as the middle term. In the same
manner *Bokardo*^c to *Darii* ; e. g.

Some slaves are not discontented ;

^b Or Fakoro.

^c Or Dokamo.

All slaves are wronged : therefore
Some who are wronged are not discontented.

Convert the major by negation, (contraposition,) and then transpose them ; the conclusion will be the *converse by negation of the original one*, which, therefore, may be inferred from it ; e. g.

All slaves are wronged ;
Some who are not discontented are slaves :
Some who are not discontented are wronged.

In these ways (by what is called *ostensive reduction*, because you prove, in the first figure, either the *very same* conclusion as before, or one *which implies it*) all the imperfect moods may be reduced to the four perfect ones. But there is also another way, called

Reductio ad impossibile.

§ 6.

By which we prove (in the first figure) not directly that the original conclusion is *true*, but that it *cannot be false* ; i. e. that an absurdity would follow from the supposition of its being false ; e. g.

All true patriots are friends to religion ;
Some great statesmen are not friends to religion :
Some great statesmen are not true patriots.

If this conclusion be not true, its contradictory must be true ; viz.

All great statesmen are true patriots.

Let this then be assumed, in the place of the minor premiss of the original syllogism, and a false conclusion will be proved ; e. g. bAr,

All true patriots are friends to religion ;

bA, All great statesmen are true patriots :

rA, *All great statesmen are friends to religion :*

for as this conclusion is the contradictory of the original minor premiss, it must be false, since the premises are always supposed to be granted ; therefore one of the *premises* (by which it has been correctly proved) must be false also ; but the major premiss (being one of those originally granted) is *true* ; therefore the *falsity must be in the minor premiss* ; which is the *contradictory* of the original conclusion ; therefore the original conclusion must be true. This is the *indirect* mode of reasoning.

§ 7.

This kind of reduction is seldom employed but for *Baroko* and *Bokardo*, which are thus reduced by those who confine themselves to *simple* conversion, and conversion by limitation, (*per accidens* ;) and they framed the names of their moods, with a view to point out the manner in which each is to be reduced ; viz.

B, C, D, F, which are the initial letters of all the moods, indicate to which mood of the first figure (*Barbara*, *Celarent*, *Darii*, and *Ferio*) each of the others is to be reduced: *m* indicates that the premises are to be *transposed*; *s* and *p*, that the proposition denoted by the vowel immediately preceding, is to be *converted*; *s*, simply, *p*, *per accidens*, (by limitation:) thus, in *Camestres*, (see example, p. 84,) the *C* indicates that it must be reduced to *Celarent*; the two *ss*, that the minor premiss and conclusion must be *converted simply*; the *m*, that the premises must be *transposed*. *K* (which indicates the reduction *ad impossibile*) is a sign that the proposition, denoted by the vowel immediately before it, must be left out, and the contradictory of the conclusion substituted; viz. for the *minor* premiss in *Baroko*, and the *major* in *Bo-kardo*. But it has been already shown, that the conversion by contraposition (by negation) will enable us to reduce these two moods, *ostensively*^d.

Examples for Practice.

1. Every change is agreeable;
 Death is a change:
 Death is agreeable.

^d If any one should choose that the names of these moods should indicate this, he might make *K* the index of conversion by negation; and then the names would be, by a slight change, *Fakoro* and *Dokamo*.

2. Evil communications corrupt good manners ;
Idleness leads to evil communications :
Idleness corrupts good manners.
3. Fortune favours the bold ;
Fortune favours the rich :
The bold are rich.
4. Whatever you undertake, go through with ;
You have undertaken logic :
Therefore go through with it.
5. To know what is right, is not all that is requisite to make a man virtuous ;
What Scripture teaches us, is all that is requisite to make a man virtuous :
What Scripture teaches us, is not to know what is right.
6. No human institution is perfect ;
Christianity is not a human institution :
Christianity is perfect.
7. Leading vanquished enemies in triumph is a barbarous custom ;
The Hottentot customs are all barbarous :
Leading vanquished enemies in triumph is a Hottentot custom.
8. How happy is he who never wants ;
The contented man never wants :
How happy is the contented man.

9. Heathen philosophers believed that the soul of man was immortal ;
Christians believe that the soul of man is immortal :
Some Christians are heathen philosophers.
10. Many islands have no inhabitants ;
Great Britain is an island :
Great Britain has no inhabitants.
11. Perfect virtue is unattainable ;
What is unattainable cannot properly be proposed as an object of pursuit :
Perfect virtue cannot properly be proposed as an object of pursuit.
12. Honesty is the best policy ;
The best policy is not the chief aim of the honest man :
The chief aim of the honest man is not honesty.
13. Whatever biasses the mind unfits it for the candid investigation of truth ;
Education biasses the mind :
Education unfits the mind for the candid investigation of truth.
14. Learning is a difficult attainment ;
Greek and Latin are difficult attainments :
Greek and Latin are learning.

15. Flowers fade ;
Beauty fades :
Beauty is a flower.
16. Faith is a virtue ;
Credulity is not a virtue :
Credulity is not faith.
17. Whatever assists you in reading the Bible is a
portion of biblical criticism ;
Spectacles assist you in reading the Bible :
Spectacles are a portion of biblical criticism.
18. To obey God is better than sacrifice ;
What Christianity enjoins is to obey God :
Something better than sacrifice is what Christianity enjoins.
19. Money is not wealth ;
Land is not wealth :
Money is not land.

SUPPLEMENT TO PART III.—*Of Modal Syllogisms, and of all Arguments besides regular and pure Categorical Syllogisms.*

Of Modals.

§ 1.

Hitherto we have treated of *pure* categorical propositions, and the syllogisms composed of such. A *modal* proposition may be stated as

a pure one, by attaching the mode to one of the terms; and the proposition will in all respects fall under the foregoing rules: e. g. "John killed Thomas *wilfully and maliciously*;" here the mode is to be regarded as part of the predicate. "It is *probable* that all knowledge is useful;" "probably-useful" is here the predicate. But when the mode is only used to express the necessary, contingent, or impossible connection of the terms, it may as well be attached to the *subject*: e. g. "man is *necessarily* mortal;" is the same as "*all* men are mortal:" "injustice is *in no case* expedient," corresponds to "no injustice is expedient:" and "this man is *occasionally* intemperate," has the force of a *particular*: (vide Part II. § 2. p. 60.) It is thus, and thus only, that two singular propositions may be contradictories; e. g. "this man is *never* intemperate," will be the *contradictory* of the foregoing. Indeed, every sign (of universality or particularity) may be considered as a *mode*. Since, however, in all modal propositions, you assert that the dictum (i. e. the *assertion itself*) and the *mode* agree together, or disagree, so, in some cases, this may be the most convenient way of stating a modal

purely: e. g. "It is impossible that all men

subj. cop.
pred.
subject.

subject.

should be virtuous." Such is a proposition of

St. Paul's: "This ^{subj.} ^{cop.} is ^{pred.} a faithful saying, etc.
^{subject.}

that Jesus Christ came into the world to save
^{subj.}

sinner." In these cases, one of your *terms*
 (the subject) is itself *an entire proposition*.
 Thus much for modal propositions.

Of Hypotheticals.

§ 2.

A hypothetical proposition is defined to be,
two or more categoricals united by a copula, (or
conjunction,) and the different kinds of hypo-
thetical propositions are named from their re-
spective conjunctions; viz. conditional, dis-
junctive, causal, etc.

When a hypothetical conclusion is inferred
 from a hypothetical premiss, so that the force
 of the reasoning does not turn on the hypo-
 thesis, then the hypothesis (as in modals) must
 be considered *as part of one of the terms*; so
 that the *reasoning* will be, in effect; categorical:
 e. g.

Every conqueror ^{predicate.} is either a hero or a villain;
 Cæsar was a conqueror: therefore
^{predicate.}

He was either *a hero or a villain*.

Whatever comes from God is entitled to reverence;

subject.

If the Scriptures are not wholly false, they must come from God :

- If they are not wholly false, they are entitled to reverence.

But when the *reasoning* itself *rests* on the hypothesis, (in which way a categorical conclusion may be drawn from a hypothetical premiss,) this is what is called a *hypothetical syllogism*; and rules have been devised for ascertaining the validity of such arguments at once, without bringing them into the categorical form. (And note, that in these syllogisms the *hypothetical premiss* is called the *major*, and the *categorical one* the *minor*.) They are of two kinds, *conditional* and *disjunctive*.

Of Conditionals.

§ 3.

A *conditional* proposition has in it an *illative force*; i. e. it contains two, and only two categorical propositions, whereof one *results* from the other, (or follows from it,) e. g.

antecedent.

If the Scriptures are not wholly false,

consequent.

they are entitled to respect.

That from which the other results is called the *antecedent*; *that which results from it*, the *consequent*, (*consequens*;) and the *connection* between the two, (expressed by the word "if,") the *consequence* (*consequentia*.) The natural order is, that the antecedent should come *before* the consequent; but this is frequently reversed: e. g. "the husbandman is well off if he knows his own advantages;" Virg. *Geor.* And note, that the truth or falsity of a conditional proposition depends entirely on the *consequence*: e. g. "if Logic is useless, it deserves to be neglected;" here both antecedent and consequent are *false*: yet the whole proposition is *true*; i. e. it is true that the consequent *follows* from the antecedent. "If Cromwell was an Englishman, he was an usurper," is just the reverse case: for though it is true that "Cromwell was an Englishman," and also that "he was an usurper," yet it is not true that the latter of these propositions *depends on* the former; the whole proposition, therefore, is false, though both antecedent and consequent are true. A conditional proposition, in short, may be considered as an assertion of the *validity* of a certain argument; since to assert that an argument is *valid*, is to assert that the conclusion necessarily results from the premises, whether those premises be *true* or not.

The meaning, then, of a conditional proposition is this; that, *the antecedent being granted*,

the consequent is granted: which may be considered in two points of view: first, if the antecedent *be* true, the consequent *must* be true; hence the first rule; *the antecedent being granted, the consequent may be inferred*: secondly, if the antecedent *were* true, the consequent *would* be true; hence the second rule; *the consequent being denied, the antecedent may be denied*; for the antecedent must in that case be false; since if it were true, the consequent (which is granted to be false) would be true also: e. g. "if this man has a fever, he is sick:" here, if you *grant the antecedent*, the first rule applies, and you infer the truth of the consequent; "he has a fever, therefore he is sick:" if A is B, C is D; but A is B, therefore C is D, (and this is called a *constructive* conditional syllogism;) but if you *deny the consequent*, (i. e. grant its *contradictory*,) the second rule applies, and you infer the *contradictory of the antecedent*; "he is not sick, therefore he has not a fever:" this is the *destructive* conditional syllogism: if A is B, C is D; C is not D, therefore A is not B. Again, "if the crops are not bad, corn must be cheap," for a major; then, "but the crops are not bad, therefore corn must be cheap," is constructive. "Corn is not cheap, therefore the crops are bad," is destructive. "If every increase of population is desirable, some misery is desirable; but no misery is desirable; therefore

some increase of population is not desirable," is destructive. But if you *affirm* the *consequent*, or *deny* the *antecedent*, you can infer *nothing*; for the same consequent may *follow from other antecedents*: e. g. in the example above, a man may be sick *from other disorders* besides a fever; therefore it does not follow, from his being sick, that he has a fever; nor (for the same reason) from his *not* having a fever, that he is *not* sick. There are, therefore, two, and only two, kinds of conditional syllogisms; the *constructive*, founded on the first rule, and answering to *direct* reasoning; and the *destructive*, on the second, answering to *indirect*.

And note, that a conditional proposition may (like the categorical A) be *converted by negation*; i. e. you may take the *contradictory of the consequent* as an *antecedent*, and the *contradictory of the antecedent* as a *consequent*: e. g. "if this man is not sick, he has not a fever." By this conversion of the major premiss, a constructive syllogism may be reduced to a destructive, and *vice versa*. (See § 6. Ch. iv. p. 88.)

Of Disjunctives.

§ 4.

A disjunctive proposition may consist of any number of categoricals; and, of these, *some*

one, at least, must be *true*, or the whole proposition will be false: if, therefore, one or more of these categoricals be denied, (i. e. granted to be false,) you may infer that the remaining one, or (if several) *some one* of the remaining ones, is true: e. g. "either the earth is eternal, or the work of chance, or the work of an intelligent Being; it is not eternal, nor the work of chance; therefore it is the work of an intelligent Being." "It is either spring, summer, autumn, or winter; but it is neither spring nor summer; therefore it is either autumn or winter." Either A is B, or C is D; but A is not B, therefore C is D. Note, that in these examples (as well as very many others) it is implied, not only that *one* of the members (the categorical propositions) must be *true*, but that *only one* can be true; so that, in such cases, if one or more members be *affirmed*, the rest may be *denied*; [the members may then be called *exclusive*.] e. g. "it is summer, therefore it is neither spring, autumn, nor winter;" "either A is B, or C is D; but A is B, therefore C is not D." But this is by no means universally the case; e. g. "virtue tends to procure us either the esteem of mankind, or the favour of God:" here both members are true, and consequently from one being affirmed we are not authorized to deny the other.

It is evident that a disjunctive syllogism may easily be reduced to a *conditional*: e. g.

if it is not spring or summer, it is either autumn or winter, etc.

The Dilemma,*

§ 5,

is a complex kind of conditional syllogism.

1st. If you have in the *major* premiss *several antecedents*, all with the *same consequent*, then these antecedents, being (in the *minor*) *disjunctively granted*, (i. e. it being granted that *some one* of them is true,) the one *common consequent* may be inferred, (as in the case of a simple constructive syllogism :) e. g. if A is B, C is D; and if X is Y, C is D; but either A is B, or X is Y; therefore C is D. "If the blest in heaven have no desires, they will be perfectly content; so they will, if their desires are fully gratified: but either they will have

* The account usually given of the dilemma in logical treatises is singularly perplexed and unscientific. Aldrich, in speaking of it, abstains from all use of logical terms, and speaks in a loose, vague, and rhetorical manner. And it is remarkable, that all the rules he gives respecting it, and the faults against which he cautions us, relate exclusively to the *subject matter*: as if one were to lay down as rules respecting a syllogism in Barbara, "1st. Care must be taken that the major premiss be true; 2dly. That the minor premiss be true!"

Most, if not all, writers on this point either omit to tell us whether the dilemma is a kind of *conditional* or of *disjunctive* argument, or else refer it to the latter class, on account of its having one disjunctive premiss; though it clearly belongs to the class of conditionals,

Simple constructive dilemma.

no desires, or have them fully gratified; therefore they will be perfectly content." Note, in this case, the two conditionals which make up the major premiss may be united in one proposition by means of the word "*whether*;" e. g. "whether the blest, etc. have no desires, or have their desires gratified, they will be content."

Complex constructive dilemma.

2d. But if the *several antecedents* have each a *different consequent*, then the antecedents being, as before, disjunctively granted, you can only *disjunctively* infer the consequents: e. g. if A is B, C is D; and if X is Y, E is F: but either A is B, or X is Y; therefore either C is D, or E is F. "If Æschines joined in the public rejoicings, he is inconsistent; if he did not, he is unpatriotic; but he either joined, or not, therefore he is either inconsistent or unpatriotic." (Demost. *For the Crown*.) This case, as well as the foregoing, is evidently *constructive*.

In the destructive form, whether you have one antecedent with several consequents, or several antecedents either with one or with several consequents; in all these cases, if you deny the *whole* of the consequent or consequents, you may in the conclusion deny the *whole* of the antecedent or antecedents: e. g. "if the world were eternal, the most useful arts, such as printing, etc. would be of unknown antiquity: and on the same supposition, there

would be records long prior to the Mosaic; and likewise the sea and land, in all parts of the globe, might be expected to maintain the same relative situations now as formerly: but none of these is the fact: therefore the world is not eternal." Again, "if the world existed from eternity, there would be records prior to the Mosaic; and if it were produced by chance, it would not bear marks of design: there are no records prior to the Mosaic; and the world does bear marks of design: therefore it neither existed from eternity, nor is the work of chance." These are commonly called dilemmas, but hardly differ from *simple* conditional syllogisms. Nor is the case different if you have *one* antecedent with several consequents, which consequents you *disjunctively* deny; for that comes to the same thing as *wholly* denying them; since if they be not *all* true, the *one antecedent* must equally fall to the ground; and the syllogism will be equally simple: e. g.[†] "if we are at peace with France by virtue of the treaty of Paris, we must acknowledge the sovereignty of Buonaparte; and also we must acknowledge that of Lewis: but we cannot do both of these; therefore we are not at peace," etc.; which is evidently a plain destructive. The true dilemma is, "*a conditional syllogism with several antecedents in the major, and a disjunctive minor;*" hence,

[†] A. D. 1815.

Destructive
dilemma.

3d. That is most properly called a *destructive dilemma*, which has (like the constructive ones) a *disjunctive minor premiss*; i. e. when you have several antecedents with each a different consequent; which consequents (instead of wholly denying them, as in the case lately mentioned) you *disjunctively* deny; and thence, in the conclusion, deny disjunctively the antecedents: e. g. if A is B, C is D; and if X is Y, E is F: but either C is not D, or E is not F; therefore, either A is not B, or X is not Y. "If this man were wise, he would not speak irreverently of Scripture in jest; and if he were good, he would not do so in earnest; but he does it, either in jest or earnest; therefore he is either not wise or not good."

Resolution
of a dilemma.

Every dilemma may be reduced into two or more simple conditional syllogisms: e. g. "If Æschines joined, etc. he is inconsistent; he *did* join, etc. therefore he is inconsistent: and again, if Æschines did not join, etc. he is unpatriotic; he *did not*, etc. therefore he is unpatriotic." Now an opponent might deny *either* of the minor premises in the above syllogisms, but he could not deny *both*; and therefore he must admit one or the other of the conclusions: for when a dilemma is employed, it is supposed that *some one* of the antecedents must be true, (or, in the destructive kind, *some one* of the consequents false,) but that we cannot tell *which* of them is so; and this is the

reason why the argument is stated in the form of a dilemma.

From what has been said, it may easily be seen that all dilemmas are in fact *conditional syllogisms*; and that disjunctive syllogisms may also be reduced to the form of conditionals: but as it has been remarked, that all reasoning whatever may *ultimately* be brought to the one test of Aristotle's dictum, it remains to show how a conditional syllogism may be thrown into such a form, that that test will at once apply to it; and this is called the

Reduction of Hypotheticals^s.

§ 6.

For this purpose we must consider every conditional proposition as a universal affirma-

^s Aldrich has stated, through a mistake, that Aristotle utterly despised hypothetical syllogisms, and thence made no mention of them; but he did indicate his intention to treat of them in some part of his work, which either was not completed by him according to his design, or else (in common with many of his writings) has not come down to us.

Aldrich observes, that no hypothetical argument is valid which cannot be reduced to a categorical form; and this is evidently agreeable to what has been said at the beginning of this part; but then he has unfortunately omitted to teach us *how* to reduce hypotheticals to this form, except in the case where the antecedent and consequent chance to have each the *same* subjects; in which case, he tells us to take the minor premiss and conclusion as an enthymeme, and fill that up categorically; e.g. "If Cæsar was a tyrant, he deserved death: he was a tyrant;

tive categorical proposition, of which the terms are entire propositions, viz. the antecedent answering to the *subject*, and the consequent to the *predicate*; e. g. to say, "if Lewis is a good king, France is likely to prosper," is equivalent to saying, "the case of Lewis being a good king, is a case of France being likely to prosper:" and if it be granted, as a minor premiss to the conditional syllogism, that "Lewis is a good king," that is equivalent to saying, "the present case is the case of Lewis being a good king;" from which you will draw a conclusion in *Barbara*, (viz. "the present case is

therefore he deserved death;" which may easily be reduced to a categorical form, by taking as a major premiss, "all tyrants deserve death." But when (as is often the case) the antecedent and consequent have not each the same subject, (as in the very example he gives, "if A is B, C is D,") he gives no rule for reducing such a syllogism as has a premiss of this kind; and indeed leads us to suppose that it is to be rejected as invalid, though he has just before demonstrated its validity. And this is likely to have been one among the various causes which occasion many learners to regard the whole system of logic as a string of idle reveries, having nothing true, substantial, or practically useful in it; but of the same character with the dreams of alchemy, demonology, and judicial astrology. Such a mistake is surely the less inexcusable in a learner, when his master first *demonstrates* the validity of a certain argument, and then tells him that after all it is good for nothing; (*prorsus repudiandum.*) In the late editions of Aldrich's Logic, all that he says of the reduction of hypotheticals is omitted; which certainly would have been an improvement, if a more correct one had been substituted; but as it is, there is a complete hiatus in the system.

a case of France being likely to prosper,") exactly equivalent to the original conclusion of the conditional syllogism; viz. "France is likely to prosper." As the constructive conditional may thus be reduced to *Barbara*, so may the destructive, in like manner, to *Celarent*: e. g. "if the Stoics are right, pain is no evil; but pain is an evil; therefore the Stoics are not right;" is equivalent to—"the case of the Stoics being right, is the case of pain being no evil; the present case is not the case of pain being no evil; therefore the present case is not the case of the Stoics being right." This is *Camestres*, which, of course, is easily reduced to *Celarent*. Or, if you will, all conditional syllogisms may be reduced to *Barbara*, by considering them all as constructive; which may be done, as mentioned above, by converting by negation the major premiss. (See p. 99.)

The reduction of hypotheticals may always be effected in the manner above stated; but as it produces a circuitous awkwardness of expression, a more convenient form may in some cases be substituted: e. g. in the example above, it may be convenient to take "*true*" for one of the terms: "that pain is no evil is not true; that pain is no evil is asserted by the Stoics; therefore something asserted by the Stoics is not true." Sometimes, again, it may be better to unfold the argument into two syllogisms: e. g. in a former example; first,

"Lewis is a good king; the governor of France is Lewis; therefore the governor of France is a good king." And then, second, "every country governed by a good king is likely to prosper," etc. [A dilemma is generally to be reduced into two or more categorical syllogisms.] And when the antecedent and consequent have each the *same* subject, you may sometimes reduce the conditional by merely substituting a categorical major premiss for the conditional one: e. g. instead of "if Cæsar was a tyrant, he deserved death; he was a tyrant, therefore he deserved death;" you may put for a major, "all tyrants deserve death," etc. But it is of no great consequence, whether hypotheticals are reduced in the most *neat and concise* manner or not; since it is not intended that they should be reduced to categoricals, in *ordinary practice*, as the *readiest way* of trying their validity, (their own rules being quite sufficient for that purpose;) but only *that we should be able*, if required, to subject any argument whatever to the test of Aristotle's dictum, in order to show that all reasoning turns upon one simple principle.

Examples for Practice.

1. If the pope is infallible, it must be because he is inspired;
But he is not inspired; therefore
He is not infallible.

2. If an oath administered in a court of justice be a religious rite, to violate it is a sin against God ; if it be a civil ceremony, to violate it is an offence against the laws of the land : but it is both a religious rite and a civil ceremony ; therefore to violate it is both a sin against God, and an offence against the laws of the land.
3. If the British constitution were perfect, we should enjoy liberty : we do enjoy liberty ; therefore the British constitution is perfect.
4. If there be a future state, the wicked can hope for no enjoyment after this life ; if there be not, they can hope for none : but there must either be a future state or not ; therefore the wicked can hope for no enjoyment after this life.
5. The constancy of the primitive Christian martyrs may be accounted for in various ways : they may have been enthusiasts ; they may have been deceived ; or they may have had good ground for holding the faith for which they died : they were not, however, enthusiasts, nor could they have been deceived ; therefore they had good ground for holding the faith for which they died.
6. This book is written either in Latin, Spanish, Italian, or French : it is not written in Spanish, Italian, or French ; therefore it is written in Latin.

Supply a Minor Premiss and Conclusion to the following Propositions.

1. If authors were candid, they would frequently retract their opinions.
2. If virtue be desirable on its own account, it is not merely because of future reward and punishment that the good practise it.
3. Grief is destroyed either by time, or change of pursuits, or novelty of scene, or a combination of all these.
4. If some of the assertions of geologists appear inconsistent with the Scriptural history of the creation and the deluge, it must be either because Scripture is false, or because the geologists are mistaken, or because we want certain information which would enable us to reconcile the apparent inconsistency.
5. If the liberty of the press were incompatible with the security of the government, Great Britain would at present be in a perilous condition.
6. If a tyrant resigns his power, he is unfit to enjoy life as a private man ; nor can he from his fears enjoy life if he retains his power.

Of Enthymeme, Sorites, etc.

§ 7.

There are various abridged forms of argument, which may be easily expanded into regular syllogisms : such as,

1st. The enthymeme, which is a syllogism ^{Enthymeme.} with one premiss suppressed. As all the terms will be found in the remaining premiss and conclusion, it will be easy to fill up the syllogism by supplying the premiss that is wanting, whether major or minor : e. g. " Cæsar was a tyrant; therefore he deserved death." " A free nation must be happy; therefore the English are happy."

This is the ordinary form of speaking and writing. It is evident that enthymemes may be filled up hypothetically^h.

2d. When you have a string of syllogisms, in which the conclusion of each is made the premiss of the next, till you arrive at the main or ultimate conclusion of all, you may sometimes state these briefly, in a form called *sorites*; in which the predicate of the first propo-

^h It is to be observed, that the enthymeme is *not syllogistic*; i. e. its conclusiveness is not apparent from the mere form of expression, without regard to the meaning of the terms, because it is from *that* we form our judgment as to the truth of the suppressed premiss. The sorites, on the other hand, is strictly syllogistic; as may be seen by the examples.

sition is made the subject of the next; and so on, to any length, till finally the predicate of the last of the premises is predicated (in the conclusion) of the subject of the first: e. g. A is B, B is C, C is D, D is E; therefore A is E. "The English are a brave people; a brave people are free; a free people are happy; therefore the English are happy." A sorites, then, has as many middle terms as there are intermediate propositions between the first and the last; and, consequently, it may be drawn out into as many separate syllogisms; of which the first will have for its *major premiss* the second, and for its *minor*, the *first* of the propositions of the sorites; as may be seen by the example. It is also evident, that in a sorites you cannot have more than *one* negative proposition, and *one* particular; for else, one of the syllogisms would have its premises both negative or both particular, (vide p. 78.)

Hypothetical
sorites.

A string of conditional syllogisms may in like manner be abridged into a sorites: e. g. if A is B, C is D; if C is D, E is F; if E is F, G is H; but A is B, therefore G is H. "If the Scriptures are the word of God, it is important that they should be well explained; if it is important, etc. they deserve to be diligently studied; if they deserve, etc. an order of men should be set aside for that purpose; but the Scriptures are the word, etc.; therefore an

order of men should be set aside for the purpose¹," etc.

Those who have spoken of *induction* or of Induction. *example*, as a distinct kind of argument in a *Example*. logical point of view, have fallen into the common error of confounding *logical* with *rhetorical* distinctions, and have wandered from their subject as much as a writer on the orders of architecture would do, who should introduce the distinction between buildings of brick and of marble: Logic takes no cognizance of *induction*, for instance, or of *à priori* reasoning, etc. as distinct *forms* of argument; for when thrown into the syllogistic form, and when letters of the alphabet are substituted for the terms, (and it is thus that an argument is properly to be brought under the cognizance of logic,) there is no distinction between them: e. g. a "property which belongs to the ox, sheep, deer, goat, and antelope, belongs to all horned animals; rumination belongs to these; therefore to all." This, which is an inductive argument, is evidently a syllogism in *Barbara*. The essence of an inductive argument (and so of the other kinds which are distinguished for it) consists, not in the *form of the argument*, but in the relation which the *subject matter*

¹ Hence it is evident how injudicious an arrangement has been adopted by former writers on logic, who have treated of the sorites and enthymeme before they entered on the subject of hypotheticals.

of the premises bears to that of the conclusion^k."

3d. There are various other abbreviations commonly used, which are so obvious as hardly to call for explanation: as where one of the premises of a syllogism is itself the conclusion of an enthymeme which is expressed at the same time: e. g. "all useful studies deserve encouragement; logic is such, (*since it helps us to reason accurately;*) therefore it deserves encouragement:" here the minor premiss is what is called an *enthymematic sentence*. The *antecedent* in that minor premiss (i. e. that which *makes* it enthymematic) is called by Aristotle the *prosyllogism*.

It is evident that you may, for brevity, substitute for any term an *equivalent*; as in the last example, "*it*," for "logic;" "*such*," for "a useful study," etc.

Syllogisms
apparently
incorrect.

4th. And many syllogisms, which at first sight appear faulty, will often be found, on examination, to contain correct reasoning, and, consequently, to be reducible to a regular form; e. g. when you have, *apparently, negative premises*, it may happen, that by considering one of them as *affirmative*; (see Ch. II. §. 4.

^k Nothing probably has tended more to foster the prevailing error of considering syllogism as a *particular kind of argument*, than the inaccuracy just noticed, which appears in all or most of the logical works extant. See Dissertation on the province of Reasoning, Ch. 1.

p. 67.) the syllogism will be regular: e. g. "no man is happy who is not secure; no tyrant is secure; therefore no tyrant is happy," is a syllogism in *Celarent*¹. Sometimes there will appear to be too many terms; and yet there will be no fault in the reasoning, only an irregularity in the expression: e. g. "no irrational agent could produce a work which manifests design; the universe is a work which manifests design; therefore no irrational agent could have produced the universe." Strictly speaking, this syllogism has five terms; but if you look to the meaning, you will see, that in the first premiss (considering it *as a part of this argument*) it is not, properly, "an irrational agent" that you are speaking of, and of which you predicate that it could not produce a work manifesting design; but rather it is this "work," etc. of which you are speaking, and of which it is predicated that it could not be produced by an irrational agent: if then you state the propositions in that form, the syllogism will be perfectly regular.

¹ If this experiment be tried on a syllogism which has *really* negative premises, the only effect will be to change that fault into another: viz. an excess of terms, or (which is substantially the same) an undistributed middle: e. g. "an enslaved people is not happy; the English are not enslaved; therefore they are happy:" if "enslaved" be regarded as one of the terms, and "not-enslaved" as another, there will manifestly be four. Hence you may see how very little difference there is in reality between the different faults which are enumerated.

Thus, such a syllogism as this, "every true patriot is disinterested; few men are disinterested; therefore few men are true patriots;" might appear, at first sight, to be in the second figure, and faulty; whereas it is *Barbara*, with the *premiss transposed*; for you do not really predicate of "few men," that they are "disinterested," but of "*disinterested persons*," that they are "few." Again, "none but candid men are good reasoners; few infidels are candid; few infidels are good reasoners." In this it will be most convenient to consider the major premiss as being, "all good reasoners are candid," (which, of course, is precisely equipollent to its illative converse by negation;) and the minor premiss and conclusion may in like manner be fairly expressed thus—"most infidels are not candid; therefore most infidels are not good reasoners:" which is a regular syllogism in *Camestres*. Or, if you would state it in the first figure, thus—those who are not candid (or uncandid) are not good reasoners; most infidels are not candid; most infidels are not good reasoners.

§ 8.

Mistakes as
to the office
of logic.

The foregoing rules enable us to develop the principles on which all reasoning is conducted, whatever be the subject matter of it, and to ascertain the validity or fallaciousness of any apparent argument, as far as the *form*

of *expression* is concerned; that being alone the proper province of logic.

But it is evident, that we may nevertheless remain liable to be deceived or perplexed in argument by the assumption of *false or doubtful premises*, or by the employment of *indistinct or ambiguous terms*: and, accordingly, many logical writers, wishing to make their systems appear as perfect as possible, have undertaken to give rules "for attaining clear ideas," and for "guiding the judgment;" and, fancying or professing themselves successful in this, have consistently enough denominated logic, the "art of using the reason;" which in truth it would be, and would supersede all other studies, if it could of itself ascertain the *meaning* of every *term*, and the *truth or falsity* of every *proposition*, in the same manner as it actually can the *validity* of every *argument*. And they have been led into this, partly by the consideration that logic is concerned about the three operations of the mind—simple apprehension, judgment, and reasoning; not observing that it is not equally concerned about all: the last operation being alone its appropriate province; and the rest being treated of only in reference to that.

The contempt justly due to such pretensions has most unjustly fallen on the science itself; much in the same manner as chemistry was brought into disrepute among the unthinking

by the extravagant pretensions of the alchemists. And those logical writers have been censured, not (as they should have been) for *making* such professions, but for *not fulfilling* them. It has been objected, especially, that the rules of logic leave us still at a loss as to the most important and difficult point in reasoning; viz. the ascertaining the sense of the terms employed, and removing their ambiguity: a complaint resembling that made (according to a story told by Warburton in his *Div. Leg.* and before alluded to) by a man who found fault with all the reading glasses presented to him by the shopkeeper; the fact being, that he had never *learnt to read*. In the present case, the complaint is the more unreasonable, inasmuch as there neither is, nor ever *can possibly be*, any such system devised as will effect the proposed object of clearing up the ambiguity of terms. It is, however, no small advantage, that the rules of logic, though they cannot alone ascertain and clear up ambiguity in any term, yet do point out in *which* term of an argument it is to be sought for; directing our attention to the *middle* term, as the one on the ambiguity of which a fallacy is likely to be built.

APPENDIX.

MISCELLANEOUS EXAMPLES FOR THE EXERCISE OF LEARNERS.

N. B. In such of the following examples as are not in a syllogistic form, it is intended that the student should practise the reduction of them into that form; those of them, that is, in which the reasoning is in itself sound: viz. where it is impossible to admit the premises and deny the conclusion. Of such as are apparent syllogisms, the validity must be tried by logical rules, which it may be advisable to apply in the following order: 1st. Observe whether the argument be categorical or hypothetical; recollecting that an hypothetical premiss does not necessarily imply an hypothetical syllogism, unless the reasoning turns on the hypothesis. If this appear to be the case, the rules for hypothetical syllogisms must be applied. 2dly.

If the argument be categorical, count the terms. 3dly. If only three, observe whether the middle be distributed. 4thly. Observe whether the premises are both negative ; (i. e. really, and not in appearance only;) and if one is, whether the conclusion be negative also ; or affirmative, if both premises affirmative. 5thly. Observe what terms are distributed in the conclusion, and whether the same are distributed in the premises. 6thly. If the syllogism is not a categorical in the first figure, reduce it to that form. ↗

1. No one is free who is enslaved by his appetites : a sensualist is enslaved by his appetites ; therefore a sensualist is not free.

2. None but whites are civilized : the ancient Germans were whites ; therefore they were civilized.

3. None but whites are civilized : the Hindoos are not whites ; therefore they are not civilized.

4. None but civilized people are whites : the Gauls were whites ; therefore they were civilized.

5. No one is rich who has not enough : no miser has enough ; therefore no miser is rich.

6. If penal laws against papists were enforced, they would be aggrieved : but penal

laws against them are not enforced ; therefore the papists are not aggrieved.

7. If all testimony to miracles is to be admitted, the popish legends are to be believed : but the popish legends are not to be believed ; therefore no testimony to miracles is to be admitted.

8. If men are not likely to be influenced in the performance of a known duty by taking an oath to perform it, the oaths commonly administered are superfluous : if they are likely to be so influenced, every one should be made to take an oath to behave rightly throughout his life : but one or the other of these must be the case ; therefore either the oaths commonly administered are superfluous, or every man should be made to take an oath to behave rightly throughout his life.

9. The Scriptures must be admitted to be agreeable to truth ; and the church of England is conformable to the Scriptures : A. B. is a divine of the church of England ; and this opinion is in accordance with his sentiments ; therefore it must be presumed to be true.

10. Enoch (according to the testimony of Scripture) pleased God ; but without faith it is impossible to please Him, (for he that cometh to God must believe that He is, and that He is a rewarder of them that diligently seek Him ;) therefore, etc.

11. "If Abraham were justified by works, then had he whereof to glory [before God:] but not [any one can have whereof to glory] before God;" therefore Abraham was not justified by works.

12. "He that is of God heareth my words; ye therefore hear them not, because ye are not of God."

13. Few treatises of science convey important truths, without any intermixture of error, in a perspicuous and interesting form; and therefore, though a treatise would deserve much attention which should possess such excellence, it is plain that few treatises of science do deserve much attention.

14. We are bound to set apart one day in seven for religious duties, if the fourth commandment is obligatory on us: but we are bound to set apart one day in seven for religious duties; and hence it appears, that the fourth commandment is obligatory on us.

15. Abstinence from the eating of blood had reference to the divine institution of sacrifices: one of the precepts delivered to Noah was abstinence from the eating of blood; therefore one of the precepts delivered to Noah was the divine institution of sacrifices.

16. If expiatory sacrifices were divinely appointed before the Mosaic law, they must have been expiatory, not of ceremonial sin, (which

could not then exist,) but of moral sin: if so, the Levitical sacrifices must have had no less efficacy; and in that case, the atonements under the Mosaic law would have "made the comers thereunto perfect as pertaining to the conscience;" but this was not the case; therefore, etc.^a

17. The adoration of images is forbidden to Christians, if we suppose the Mosaic law designed not for the Israelites alone, but for all men: it was designed, however, for the Israelites alone, and not for all men; therefore the adoration of images is not forbidden to Christians.

18. A desire to gain by another's loss is a violation of the tenth commandment: all gaming, therefore, since it implies a desire to profit at the expense of another, involves a breach of the tenth commandment.

19. All the fish that the net enclosed were an indiscriminate mixture of various kinds: those that were set aside and saved as valuable, were fish that the net enclosed; therefore those that were set aside and saved as valuable, were an indiscriminate mixture of various kinds.

20. All the elect are finally saved: such persons as are arbitrarily appointed out of mankind by the divine decree are the elect;

^a Davison on Prophecy.

therefore such persons as are arbitrarily appointed out of mankind by the divine decree are finally saved^b.

21. No one who lives with another on terms of confidence is justified, on any pretence, in killing him: Brutus lived on terms of confidence with Cæsar; therefore he was not justified, on the pretence he pleaded, in killing him.

22. He that destroys a man who usurps despotic power in a free country, deserves well of his countrymen: Brutus destroyed Cæsar, who usurped despotic power in Rome; therefore he deserved well of the Romans.

23. If virtue is voluntary, vice is voluntary: virtue is voluntary; therefore so is vice^c.

24. A wise lawgiver must either recognise the rewards and punishments of a future state, or must be able to appeal to an extraordinary Providence, dispensing them regularly in this life: Moses did not do the former; therefore he must have done the latter.

25. Nothing which is of less frequent occurrence than the falsity of testimony can be fairly established by testimony: any extraordinary and unusual fact is a thing of less frequent occurrence than the falsity of testimony, (that

^b The opponents of this conclusion generally deny the minor premiss and admit the major: the reverse would be the more sound and the more effectual objection.

^c Arist. Eth. b. iii.

being very common;) therefore no extraordinary and unusual fact can be fairly established by testimony.

26. Testimony is a kind of evidence which is very likely to be false: the evidence on which most men believe that there are pyramids in Egypt is testimony; therefore the evidence on which most men believe that there are pyramids in Egypt is very likely to be false.

27. The religion of the ancient Greeks and Romans was a tissue of extravagant fables and groundless superstitions, credited by the vulgar and the weak, and maintained by the more enlightened, from selfish or political views: the same was clearly the case with the religion of the Egyptians: the same may be said of the Brahminical worship of India, and the religion of Fo, professed by the Chinese: the same, of the romantic mythological system of the Peruvians, of the stern and bloody rites of the Mexicans, and those of the Britons and of the Saxons: hence we may conclude, that all systems of religion, however varied in circumstances, agree in being superstitions kept up among the vulgar, from interested or political views in the more enlightened classes.

28. No man can possess power to perform impossibilities: a miracle is an impossibility; therefore no man can possess power to perform a miracle.

29. A B, and C D, are each of them equal to E F; therefore they are equal to each other.

30. Protection from punishment is plainly due to the innocent; therefore, as you maintain that this person ought not to be punished, it appears that you are convinced of his innocence.

31. All the most bitter persecutions have been religious persecutions: among the most bitter persecutions were those which occurred in France during the revolution; therefore they must have been religious persecutions.

32. He who cannot possibly act otherwise than he does, has neither merit nor demerit in his action: a liberal and benevolent man cannot possibly act otherwise than he does in relieving the poor; therefore such a man has neither merit nor demerit in his action.

33. What happens every day is not improbable: some things against which the chances are many thousands to one, happen every day; therefore some things against which the chances are many thousands to one, are not improbable.

34. The early and general assignment of the Epistle to the Hebrews to St. Paul as its author, must have been, either from its professing to be his, and containing his name, or from its really being his; since, therefore, the former of these is not the fact, the epistle must be St. Paul's.

35. "With some of them God was not well pleased; for they were overthrown in the wilderness."

36. A sensualist wishes to enjoy perpetual gratifications without satiety: it is impossible to enjoy perpetual gratifications without satiety; therefore it is impossible for a sensualist to obtain his wish.

37. If Paley's system is to be received, one who has no knowledge of a future state has no means of distinguishing virtue and vice: now one who has no means of distinguishing virtue and vice can commit no sin; therefore if Paley's system is to be received, one who has no knowledge of a future state can commit no sin.

38. The principles of justice are variable: the appointments of nature are invariable; therefore the principles of justice are no appointment of nature^d.

39. Every one desires happiness: virtue is happiness; therefore every one desires virtue^e.

40. A story is not to be believed, the reporters of which give contradictory accounts of it: the story of the life and exploits of Buonaparte is of this description; therefore it is not to be believed^f.

41. When the observance of the first day of the week, as a religious festival in commemoration of Christ's resurrection, was first intro-

^d Arist. Eth. b. v.

^e Arist. Eth. b. iii.

^f Vide Elements, p. 10.

duced, it must have been a novelty: when it was a novelty, it must have attracted notice: when it attracted notice, it would lead to enquiry respecting the truth of the resurrection: when it led to this enquiry, it must have exposed the story as an imposture, supposing it not attested by living witnesses: therefore, when the observance of the first day of the week, etc. was first introduced, it must have exposed as an imposture the story of the resurrection, supposing it not attested by living witnesses.

42. All the miracles of Jesus would fill more books than the world could contain: the things related by the evangelists are the miracles of Jesus; therefore the things related by the evangelists would fill more books than the world could contain.

43. If the prophecies of the Old Testament had been written without knowledge of the events of the time of Christ, they could not correspond with them exactly; and if they had been forged by Christians, they would not be preserved and acknowledged by the Jews: they are preserved and acknowledged by the Jews, and they correspond exactly with the events of the time of Christ; therefore they were neither written without knowledge of those events, nor were forged by Christians.

44. Of two evils the less is to be preferred; occasional turbulence, therefore, being a less

evil than rigid despotism, is to be preferred to it.

45. According to theologians, a man must possess faith in order to be acceptable to the Deity: now he who believes all the fables of the Hindoo mythology must possess faith; therefore such an one must, according to theologians, be acceptable to the Deity.

46. If Abraham were justified, it must have been either by faith or by works: now he was not justified by faith, (according to St. James,) nor by works, (according to St. Paul;) therefore Abraham was not justified.

47. No evil should be allowed that good may come of it: all punishment is an evil; therefore no punishment should be allowed that good may come of it.

48. Repentance is a good thing: wicked men abound in repentance^s; therefore wicked men abound in what is good.

49. A person infected with the plague will (probably) die, [suppose three in five of the infected die:] this man is (probably) infected with the plague, [suppose it an even chance:] therefore he will (probably) die. [*Query*, What is the amount of this probability?]

50. It must be admitted, indeed, that a man who has been accustomed to enjoy liberty cannot be happy in the condition of a slave: many

^s Arist. Eth. b. ix.

of the negroes, however, may be happy in the condition of slaves, because they have never been accustomed to enjoy liberty.

51. Whatever is dictated by nature is allowable: devotedness to the pursuit of pleasure in youth, and to that of gain in old age, are dictated by nature^b; therefore they are allowable.

52. He is the greatest lover of any one who seeks that person's greatest good: a virtuous man seeks the greatest good for himself; therefore a virtuous man is the greatest lover of himselfⁱ.

53. He who has a confirmed habit of any kind of action, exercises no self-denial in the practice of that action: a good man has a confirmed habit of virtue; therefore he who exercises self-denial in the practice of virtue is not a good man^k.

54. That man is independent of the caprices of fortune who places his chief happiness in moral and intellectual excellence: a true philosopher is independent of the caprices of fortune; therefore a true philosopher is one who places his chief happiness in moral and intellectual excellence.

55. A system of government which extends to those actions that are performed secretly, must be one which refers either to a regular

^b Arist. Rhet. b. ii.

ⁱ Arist. Eth. b. ix.

^k Arist. Eth. b. ii.

divine providence in this life, or to the rewards and punishments of another world: every perfect system of government must extend to those actions which are performed secretly; no system of government, therefore, can be perfect which does not refer either to a regular divine providence in this life, or to the rewards and punishments of another world¹.

56. For those who are bent on cultivating their minds by diligent study, the incitement of academical honours is unnecessary; and it is ineffectual for the idle, and such as are indifferent to mental improvement: therefore the incitement of academical honours is either unnecessary or ineffectual.

57. He who is properly to be called an actor, does not endeavour to make his hearers believe that the sentiments he expresses, and the feelings he exhibits, are really his own: a barrister does this; therefore he is not properly to be called an actor.

58. He who bears arms at the command of the magistrate, does what is lawful for a Christian: the Swiss in the French service, and the British in the American service, bore arms at the command of the magistrate; therefore they did what was lawful for a Christian.

59. If Lord Bacon is right, it is improper to stock a new colony with the refuse of jails: but

¹ Warburton's Divine Legation.

this we must allow not to be improper, if our method of colonizing New South Wales be a wise one; if this be wise, therefore, Lord Bacon is not right.

60. Logic is indeed worthy of being cultivated, if Aristotle is to be regarded as infallible: but he is not; logic, therefore, is not worthy of being cultivated.

61. All studies are useful which tend to advance a man in life, or to increase national and private wealth: but the course of studies pursued at Oxford has no such tendency; therefore it is not useful.

62. If the exhibition of criminals, publicly executed, tends to heighten in others the dread of undergoing the same fate, it may be expected that those soldiers who have seen the most service, should have the most dread of death in battle: but the reverse of this is the case; therefore the former is not to be believed.

63. If the everlasting favour of God is not bestowed at random, and on no principle at all, it must be bestowed either with respect to men's persons, or with respect to their conduct: but "God is no respecter of persons;" therefore his favour must be bestowed with respect to men's conduct^m.

64. If transportation is not felt as a severe

^m Sumner's Apostolical Preaching.

punishment, it is in itself ill suited to the prevention of crime : if it is so felt, much of its severity is wasted, from its taking place at too great a distance to affect the feelings, or even come to the knowledge, of most of those whom it is designed to deter : but one or other of these must be the case ; therefore transportation is not calculated to answer the purpose of preventing crime.

65. War is productive of evil ; therefore peace is likely to be productive of good.

66. Some objects of great beauty answer no other perceptible purpose but to gratify the sight : many flowers have great beauty ; and many of them accordingly answer no other purpose but to gratify the sight.

67. A man who deliberately devotes himself to a life of sensuality is deserving of strong reprobation : but those do not deliberately devote themselves to a life of sensuality who are hurried into excess by the impulse of the passions ; such, therefore, as are hurried into excess by the impulse of the passions, are not deserving of strong reprobation^a.

68. It is a difficult task to restrain all inordinate desires : to conform to the precepts of Scripture implies a restraint of all inordinate desires ; therefore it is a difficult task to conform to the precepts of Scripture.

^a Arist. Eth. b. vii.

69. Any one who is candid will refrain from condemning a book without reading it: some reviewers do not refrain from this; therefore some reviewers are not candid.

70. If any objection that can be urged would justify a change of established laws, no laws could reasonably be maintained: but some laws can reasonably be maintained; therefore no objection that can be urged will justify a change of established laws.

71. If any complete theory could be framed to explain the establishment of Christianity by human causes, such a theory would have been proposed before now: but none such ever has been proposed; therefore no such theory can be framed.

72. He who is content with what he has, is truly rich: a covetous man is not content with what he has; no covetous man, therefore, is truly rich.

73. A true prophecy coincides precisely with all the circumstances of such an event as could not be conjectured by natural reason: this is the case with the prophecies of the Messiah contained in the Old Testament; therefore these are true prophecies.

74. The connection of soul and body cannot be comprehended or explained: but it must be believed; therefore something must be believed which cannot be comprehended or explained.

75. Lias lies above red sandstone: red sandstone lies above coal; therefore lias lies above coal.

76. Cloven feet belonging universally to horned animals, we may conclude that this fossil animal, since it appears to have had cloven feet, was horned.

77. All that glitters is not gold: tinsel glitters; therefore it is not gold.

78. A negro is a man; therefore he who murders a negro murders a man.

79. Meat and drink are necessities of life: the revenues of Vitellius were spent on meat and drink; therefore the revenues of Vitellius were spent on the necessities of life.

80. Nothing is heavier than platina: feathers are heavier than nothing; therefore feathers are heavier than platina.

81. The child of Themistocles governed his mother; she governed her husband; he governed Athens; Athens, Greece; and Greece, the world: therefore the child of Themistocles governed the world.

82. He who calls you a man speaks truly: he who calls you a fool, calls you a man; therefore he who calls you a fool speaks truly.

83. Warm countries alone produce wines: Spain is a warm country; therefore Spain produces wines.

84. It is an intensely cold climate that is sufficient to freeze quicksilver: the climate of

Siberia is sufficient to freeze quicksilver; therefore the climate of Siberia is intensely cold.

85. Mistletoe of the oak is a vegetable excrescence which is not a plant; and every vegetable excrescence which is not a plant, is possessed of magical virtues: therefore mistletoe of the oak is possessed of magical virtues.

86. If the hour-hand of a clock be any distance (suppose a foot) before the minute-hand, this last, though moving twelve times faster, can never overtake the other; for while the minute-hand is moving over those twelve inches, the hour-hand will have moved over one inch, so that they will then be an inch apart; and while the minute-hand is moving over that one inch, the hour-hand will have moved over $\frac{1}{12}$ th of an inch, so that it will still be a-head; and again, while the minute-hand is passing over that space of $\frac{1}{12}$ th of an inch, which now divides them, the hour-hand will pass over $\frac{1}{144}$ th of an inch; so that it will still be a-head, though the distance between the two is diminished, etc. and thus it is plain we may go on for ever: therefore the minute-hand can never overtake the hour-hand°.

° This is one of the sophistical puzzles noticed by Aldrich, (the moving bodies being Achilles and a tortoise;) but he is not happy in his attempt at a solution. He proposes to remove the difficulty by demonstrating that, in a certain given time, Achilles *would* overtake the tortoise; as if any one had ever doubted that. The very problem proposed is to surmount the difficulty of a seeming demonstration of a thing palpably impos-

87. Theft is a crime: theft was encouraged by the laws of Sparta; therefore the laws of Sparta encouraged crime.

88. Every hen comes from an egg: every egg comes from a hen; therefore every egg comes from an egg.

89. Jupiter was the son of Saturn; therefore the son of Jupiter was the grandson of Saturn.

90. All cold is to be expelled by heat: this person's disorder is a cold; therefore it is to be expelled by heat.

91. Wine is a stimulant; therefore in a case where stimulants are hurtful, wine is hurtful.

92. Opium is a poison: but physicians advise some of their patients to take opium; therefore physicians advise some of their patients to take poison.

93. What we eat grew in the fields: loaves of bread are what we eat; therefore loaves of bread grew in the fields.

94. Animal food may be entirely dispensed with: (as is shown by the practice of the Brahmins: to show that it is palpably impossible, is no solution of the problem.

I have heard the present example adduced as a proof that the pretensions of logic are futile, since (it was said) the most perfect logical demonstration may lead from true premises to an absurd conclusion. The reverse is the truth: the example before us furnishes a confirmation of the utility of an acquaintance with the syllogistic form; *in which form the pretended demonstration in question cannot possibly be exhibited.* An attempt to do so will evince the utter want of connection between the premises and the conclusion.

mins and of some monks :) and vegetable food may be entirely dispensed with: (as is plain from the example of the Esquimaux and others :) but all food consists of animal food and vegetable food ; therefore all food may be dispensed with.

95. No trifling business will enrich those engaged in it: a mining speculation is no trifling business; therefore a mining speculation will enrich those engaged in it.

96. He who is most hungry eats most: he who eats least is most hungry; therefore he who eats least eats most^P.

97. Whatever body is in motion must move either in the place where it is, or in a place where it is not: neither of these is possible; therefore there is no such thing as motion^Q.

98. All vegetables grow most in the increase of the moon: hair is a vegetable; therefore hair grows most in the increase of the moon.

99. Most of the studies pursued at Oxford

^P See Aldrich's Compendium: Fallaciæ: where this is rightly solved.

^Q In this instance, as well as in the one lately noticed, Aldrich mistakes the character of the difficulty: which is, not to prove the truth of that which is self-evident, but to explain an apparent demonstration militating against that which nevertheless no one ever doubted. He says in this case, "*solvitur ambulando;*" but (*pace tanti viri*) this is no solution at all, but is the very thing which *constitutes the difficulty* in question: for it is precisely *because* we know the possibility of motion, that a seeming proof of its impossibility produces perplexity.

conduce to the improvement of the mind: all the works of the most celebrated ancients are among the studies pursued at Oxford; therefore some of the works of the most celebrated ancients conduce to the improvement of the mind.

§ EXAMPLE OF ANALYSIS.

See Preface, p. xii.

“ When we consider the deplorable ignorance and inconceivable depravity of the heathen world before the birth of Christ, which rendered a divine interposition essentially necessary, and therefore highly probable; the appearance of Christ upon earth, at the very time when his presence was most wanted, and when there was a general expectation throughout the east, that some great and extraordinary personage was soon to come into the world; the transcendent excellence of our Lord’s character, so infinitely beyond that of every other moral teacher; the calmness, the composure, the dignity, the integrity, the spotless sanctity of his manners, so utterly inconsistent with every idea of enthusiasm or imposture; the sublimity and importance of his doctrines; the consummate wisdom and perfect purity of his moral precepts, far exceeding the natural powers of a man born in the humblest situation, and in a remote and obscure corner of the world,

without learning, education, languages, or books; the rapid and astonishing propagation of his religion, in a very short space of time, through almost every region of the east, by the sole efforts of himself and a few illiterate fishermen, in direct opposition to all the power, the authority, the learning, the philosophy, the reigning vices, prejudices, and superstitions of the world; the complete and marked opposition, in every essential point, between the character and religion of Christ, and the character and religion of Mahomet, exactly such as might be expected between truth and falsehood; the minute description of all the most material circumstances of his birth, life, sufferings, death, and resurrection, given by the ancient prophets many hundred years before he was born, and exactly fulfilled in him, and him only, pointing him out as the Messiah of the Jews and the Redeemer of mankind; the various prophecies delivered by Christ himself, which were all punctually accomplished, more especially the destruction of Jerusalem by the Romans; the many astonishing miracles wrought by Jesus, in the open face of day, before thousands of spectators, the reality of which is proved by multitudes of the most unexceptionable witnesses, who sealed their testimony with their blood, and was even acknowledged by the earliest and most inveterate enemies of the Gospel; and lastly,

that most astonishing and well-authenticated miracle of our Lord's resurrection, which was the seal and confirmation of his own divine origin, and that of his religion: when all these various evidences are brought together, and impartially weighed, it seems hardly within the power of a fair and ingenuous mind to resist the impression of their united force. If such a combination of evidence as this is not sufficient to satisfy an honest enquirer into truth, it is utterly impossible that any event which passed in former times, and which we did not see with our own eyes, can ever be proved to have happened, by any degree of testimony whatever. It may safely be affirmed, that no instance can be produced of any one fact or event, said to have taken place in past ages, and established by such evidence as that on which the Christian religion rests, that afterwards turned out to be false. We challenge the enemies of our faith to bring forward, if they can, any such instance. If they cannot, (and we know it to be impossible,) we have a right to say, that a religion, supported by such an extraordinary accumulation of evidence, must be true; and that all men who pretend to be guided by argument and by proof, are bound, by the most sacred obligations, to receive the religion of Christ as a real revelation from God."—Bp. Porteus's Summary of Evidences, p. 120, etc.

§ *Analysis.*

I.

The religion of Christ is a real revelation from God.

Premiss. It is declared to be so by an extraordinary accumulation of evidence.

II.

It is declared to be so by an extraordinary accumulation of evidence.

Premiss. It is declared to be so by § the evidence of miracles wrought by Christ; § of prophecies delivered by Christ; § of ancient prophecies; § of its dissimilarity to the religion of Mahomet; § of the circumstances under which it was preached and propagated; § of its internal character; § of the character of its founder; § of the expectation of the heathen world; § and of the need of the heathen world.

[Note. This taken as one proposition is the minor premiss, by which you prove the assertion; but in order to prove this premiss, it is requisite to break it into distinct propositions, and to make each the conclusion of a separate syllogism.]

III.

It is declared to be so by the evidence of miracles wrought by Christ.

Premises; (each belonging to a distinct syllogism, the assertion being the common conclusion of all those syllogisms. See Preface, p. xii.)

§ It is declared to be so by Christ's resurrection.

§ It is declared to be so by his healing the sick, etc.

IV.

That by these miracles it is declared to be so is certain.

Major premiss. What the Christian witnesses have attested is certain.

Minor premiss. That by these miracles it is declared to be so, is what the Christian witnesses have attested.

V.

What the Christian witnesses have attested is certain.

Premiss. What they attest who seal their testimony with their blood is certain.

VI.

That by these miracles it is declared to be so, is what the Christian witnesses have attested.

Premiss. What St. Matthew, St. John, etc. have attested, is what the Christian witnesses have attested.

VII.

The religion of Christ is declared to be a real revelation from God, by the evidence of Christ's prophecies.

Premises, (each belonging to a distinct syllogism, the assertion being the common conclusion of all those syllogisms.)

§ It is declared to be so by his prophecy, that he should be delivered to the Gentiles.

§ ————— that he should be betrayed by Judas.

§ ————— that Jerusalem should be destroyed, and its destruction attended with certain circumstances specified, etc.

In this manner the learner may proceed until he arrives at the first assertion in the chain of reasoning. Further practice he will easily provide for himself. Leslie's Short and Easy Method with the Deists will be found particularly well adapted for this purpose.

It will be observed, that in all the syllogisms but one of the above analysis, a premiss has been suppressed ; because requiring no proof,

and easily supplied by the learner himself. In the first syllogism, e. g. you readily perceive that the major premiss must be, "Whatever is declared to be so by an extraordinary accumulation of evidence is a real revelation from God;" and that the syllogism expressed fully is,

Whatever is declared to be so by an extraordinary accumulation of evidence is a real revelation from God.

The religion of Christ is declared to be so by an extraordinary accumulation of evidence.

The religion of Christ is a real revelation from God.

Another point to be noticed is, that the same proposition used in different syllogisms may require to be differently expressed, in order to render the argument in each *formally* correct; which is always allowable, provided the exact meaning be preserved. If, e. g. the proposition be, "The Christian revelation is supported by an extraordinary accumulation of evidence," I am authorised to state the same differently: thus, "The evidence in support of the Christian revelation is extraordinarily accumulated."

§ *Examples of Differences of Opinion, real or apparent, which are decided without the intervention of Reasoning.*—See Preface, p. xii.

Walking in the garden with a friend, I remarked to him, “How sweet those roses smell!” “Nay,” he replied, “a rose cannot smell more than it can hear or see.”

In a conversation with A, he made use of the trite observation, that “tea is a slow poison,” and I of the reply, equally trite, that it must be a very slow one; for we had all been drinking it with impunity for many generations. I added, in answer to some authority which he quoted for the truth of his assertion, that no testimony would be sufficient to overthrow conviction derived from experience. A common friend meeting me afterwards, accused me of holding the same opinion as Hume respecting the supreme authority of experience as opposed to testimony. I denied that I had ever avowed that sentiment; and A, on being referred to, persisted in asserting that I had. See Paley’s Evidences.

Mr. B. directs his servant, during the shooting season, to take a present of birds to Mr. C. His servant, supposing the present to be intended only for the amusement of Mr. C.’s children, collects a cage full of larks, and takes them to Mr. C. Mr. C. afterwards denies that he has received any birds. The servant is ques-

tioned, and asserts that he delivered birds to Mr. C. Mr. C. asserts that he did not.

Two travellers have published accounts of the same country, which seem to be inconsistent. One speaks of the hospitality which characterised the people generally; the other speaks of the character of several tribes as decidedly inhospitable.

INDEX

TO THE

PRINCIPAL TECHNICAL TERMS.

ABSTRACTION.—The act of “drawing off” in thought, and attending to separately, some portion of an object presented to the mind, page 30.

Accident.—In its widest technical sense, any thing that is attributed to another, and can only be conceived as belonging to some substance (in which sense it is opposed to “substance:”) in its narrower and more properly logical sense, a predicable, which may be present or absent, the essence of the species remaining the same, 48.

Accidental definition.—A definition which assigns the properties of a species, or the accidents of an individual; it is otherwise called a description, 53.

Affirmative—denotes the quality of a proposition which asserts the agreement of the predicate with the subject, 59.

Analogous.—A term is so called whose single signification applies with unequal propriety to more than one object, 42. note.

Antecedent.—That part of a conditional proposition on which the other depends, 97.

Apprehension, (simple.)—The operation of the mind, by which we mentally perceive or form a notion of some object, 36.

Argument.—An expression in which, from something laid down as granted, something else is deduced, 71.

Categorematic.—A word is so called which may by itself be employed as a term, 40.

Categorical proposition—is one which affirms or denies a predicate of a subject, absolutely, and without any hypothesis, 58.

Common term—is one which is applicable in the same sense to more than one individual object, 29, 42.

Conclusion.—That proposition which is inferred from the premises of an argument, 8, 72.

Conditional proposition—is one which asserts the dependence of one categorical proposition on another. A conditional syllogism is one in which the reasoning depends on such a proposition, 97.

Consequent.—That part of a conditional proposition which depends on the other, (consequens,) 97.

Consequence.—The connection between the antecedent and consequent of a conditional proposition, (consequentia,) 97.

Contingent.—The matter of a proposition is so called when the terms of it in part agree, and in part disagree, 60.

Contradictory propositions—are those which, having the same terms, differ both in quantity and quality, 63.

Contrary propositions—are two universals, affirmative and negative, with the same terms, 63.

Converse.—65.

Conversion of a proposition—is the transposition of the terms, so that the subject is made the predicate, and *vice versa*, 65.

Copula.—That part of a proposition which affirms or denies the predicate of the subject; viz. is, or is not, expressed or implied, 39.

Definition.—An expression explanatory of that which is defined, i. e. separated, as by a boundary, from every thing else, 53.

Description.—An accidental definition, 53.

Difference (*differentia*.)—The formal or distinguishing part of the essence of a species, 47.

Discourse.—The third operation of the mind, reasoning, 36.

Disjunctive proposition—is one which consists of two or more categoricals, so stated as to imply that some one of them must be true. A syllogism is called disjunctive the reasoning of which turns on such a proposition, 99.

Distributed—is applied to a term that is employed in its full extent, so as to comprehend all its significates,—every thing to which it is applicable, 24, 59.

Division, logical—is the distinct enumeration of several things signified by a common name; and it is so called metaphorically, from its being analogous to the (real and properly-called) division of a whole into its parts, 50.

Dilemma—A complex kind of conditional syllogism, having more than one antecedent in the major premiss, and a disjunctive minor, 101.

Enthymeme.—An argument having one premiss expressed and the other understood, 111.

Equivocal.—A term is defined to be equivocal whose different significations apply equally to several objects. Strictly speaking, there is hardly a word in any language which may not be regarded as, in this sense, equivocal; but the title is usually applied only in any case where a word is *employed* equivocally; e. g. where the middle term is used in different senses in the two premises; or where a proposition is liable to be understood in various senses according to the various meanings of one of its terms.

Essential definition—is one which assigns, not the properties or accidents of the thing defined, but what are regarded as its essential parts, whether physical or logical, 53.

Extreme.—The subject and predicate of a proposition are called its extremes or terms, being, as it were, the two boundaries, having the copula (in regular order) placed between them. In speaking of a syllogism, the word is often understood to imply the extremes *of the conclusion*, 39.

Fallacy.—Any argument, or apparent argument, which professes to be decisive of the matter at issue, while in reality it is not.

False—in its strict sense, denotes the quality of a proposition which states something not as it is, 58.

Figure of a syllogism—denotes a certain situation of its middle term in reference to the extremes of the conclusion,—the major and minor terms, 80.

Generalization.—The act of comprehending under a common name several objects agreeing in some point which we abstract from each of them, and which that common name serves to indicate, 43.

Genus.—A predicable which is considered as the material part of the species of which it is affirmed, 44.

Hypothetical proposition—is one which asserts not absolutely, but under an hypothesis, indicated by a conjunction. An hypothetical syllogism is one of which the reasoning depends on such a proposition, 95.

Illative conversion—is that in which the truth of the converse follows from the truth of the exposita, or proposition given, 65.

Impossible.—The matter of a proposition is so called when the extremes altogether disagree, 63.

Indefinite proposition—is one which has for its subject a common term without any sign to indicate distribution or non-distribution, 60.

Individual.—An object which is, in the strict and primary sense, one, and consequently cannot be *logically divided*; whence the name, 50.

Induction.—A kind of argument which infers, respecting a whole class, what has been ascertained respecting one or more individuals of that class.

Infer.—To draw a conclusion from granted premises.—See Prove.

Infima species—is that which is not subdivided, except into individuals, 46.

Inseparable accident—is that which cannot be separated from the individual it belongs to, though it may from the species, 48.

Judgement.—The second operation of the mind, wherein we pronounce mentally on the agreement and disagreement of two of the notions obtained by simple apprehension, 37.

Logical definition—is that which assigns the genus and difference of the species defined, 54.

Major term of a syllogism—is the predicate of the conclusion. The major premiss is the one which contains the major term. In hypothetical syllogisms, the hypothetical premiss is called the major, 75, 96.

Middle term of a categorical syllogism—is that with which the two extremes of the conclusion are separately compared, 75, 96.

Minor term of a categorical syllogism—is the subject of the conclusion. The minor premiss is that which contains the minor term. In hypothetical syllogisms, the categorical premiss is called the minor, 75, 96.

Modal categorical proposition—is one which asserts that the predicate exists in the subject in a certain mode or manner, 58, 93.

Mood of a categorical syllogism—is the designation of its three propositions, in the order in which they stand, according to their quantity and quality, 79.

Necessary matter of a proposition—is the essential or invariable agreement of its terms, 63.

Negative categorical proposition—is one which asserts the disagreement of its extremes, 59.

Nominal definition—is one which explains only the meaning of the term defined, and nothing more of the nature of the thing signified by that term than

- is implied by the term itself to every one who understands the meaning of it, 55.
- Opposed*.—Two propositions are said to be opposed to each other, when, having the same subject and predicate, they differ either in quantity or quality, or both, 62.
- Part*.—Logically species are called parts of the genus they come under, and individuals, parts of the species; *really*, the genus is a part of the species, and the species of the individual, 50.
- Particular* proposition—is one in which the predicate is affirmed or denied of some part only of the subject, 59.
- Per accidens*.—Conversion of a proposition is so called when the quantity is changed, 66.
- Physical* definition—is that which assigns the parts into which the thing defined can be *actually* divided, 54.
- Predicate* of a proposition—is that term which is affirmed or denied of the other, 39.
- Predicable*.—A term which can be affirmatively predicated of several others, 44.
- Premiss*.—A proposition employed to establish a certain conclusion, 72.
- Property*.—A predicable which denotes something essentially conjoined to the essence of the species, 47.
- Proposition*.—A sentence which asserts, i. e. affirms or denies, 57.
- Prove*.—To adduce premises which establish the truth of a certain conclusion.
- Proximum* genus of any species—is the nearest or least remote to which it can be referred, 46.

Pure categorical proposition—is one which asserts simply that the predicate is, or is not, contained in the subject, 58.

Real definition—is one which explains the nature of the thing defined ; viz. either the *whole* nature of it, (as in mathematics,) or else something beyond what is necessarily understood by the term, 55.

Quality of a proposition—is its affirming or denying. This is the quality of the *expression*, which is, in logic, the essential circumstance. The quality of the *matter* is, its being true or false ; which is, in logic, accidental, being essential only in respect of the subject-matter treated of, 59.

Quantity of a proposition—is the extent in which its subject is taken ; viz. to stand for the whole, or for a part only, of its significates, 59.

Question.—That which is to be established as a conclusion stated in an interrogative form, 72.

Separable accident—is one which may be separated from the individual, 48.

Significate.—The several things signified by a common term are its significates, (*significata*), 59.

Singular term—is one which stands for one individual. A singular proposition is one which has for its subject, either a singular term, or a common term limited to one individual by a singular sign ; e. g. "This," 40, 61.

Sorites.—An abridged form of stating a series of syllogisms, of which the conclusion of each is a premiss of the succeeding, 111.

Species.—A predicate which is considered as expressing the whole essence of the individuals of which it is affirmed, 44.

Subaltern species and genus—is that which is both a species of some higher genus, and a genus in respect of the species into which it is divided. Subaltern opposition, is between a universal and a particular of the same quality. Of these, the universal is the subalternant, and the particular the subalternate, 46. 63.

Subcontrary opposition—is between two particulars, the affirmative and the negative, 63.

Subject of a proposition—is that term of which the other is affirmed or denied, 39.

Summum genus—is that which is not considered as a species of any higher genus, 46.

Syllogism.—An argument expressed in strict logical form; viz. so that its conclusiveness is manifest from the structure of the expression alone, without any regard to the meaning of the terms, 73.

Syncategorematic words—are such as cannot singly express a term, but only a part of a term, 40.

Term.—The subject or predicate of a proposition, 39.

True proposition—is one which states what really is, 59.

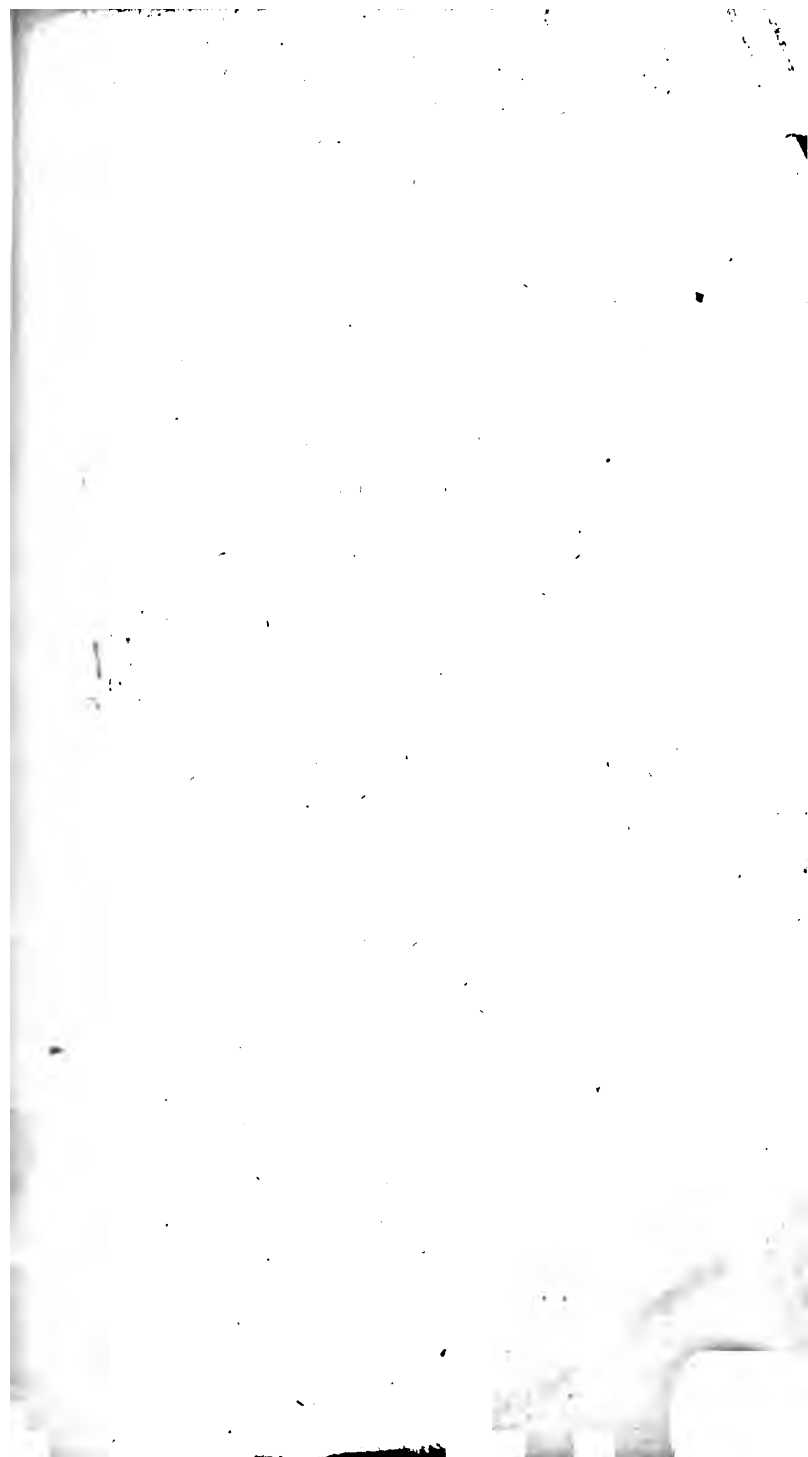
Universal proposition—is one whose predicate is affirmed or denied of the whole of the subject, 59.

Univocal.—A common term is called univocal in respect of those things to which it is applicable in the same signification, 42.

THE END.

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